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THE

NATURE AND TREATMENT

OF

DROPSY:

CONSIDERED ESPECIALLY IN REFERENCE TO THE

DISEASES OF THE INTERNAL ORGANS OF THE BODY

WHICH MOST COMMONLY PRODUCE IT.

PARTS I. AND II.

ANASARCA AND ASCITES.

TO WHICH IS ADDED,

An Appendix,

CONTAINING A TRANSLATION OF THE WORK OF

DR. GEROMINI, ON DROPSY:

FROM THE ORIGINAL ITALIAN.

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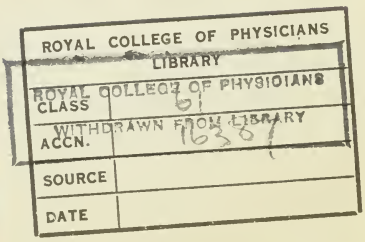
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TO

SIR BENJAMIN BRODIE, Bart. F.R.S.

SURGEON TO ST. GEORGE'S HOSPITAL,

AND

SERJEANT SURGEON TO THE KING,

THE FOLLOWING PAGES ARE INSCRIBED,

IN ADMIRATION OF HIS GREAT TALENTS, AMIABLE CHARACTER,
AND UNWEARIED ENDEAVOURS TO PROMOTE EVERY
IMPROVEMENT IN MEDICAL SCIENCE,

AND

IN GRATITUDE FOR AN UNINTERRUPTED FRIENDSHIP OF MANY
YEARS' DURATION.

CONTENTS.

PART I.

Page

ANASARCA, OR DROPSY OF THE SKIN..... 1

CHAP. I.

The proximate or immediate Cause of Dropsy 8

CHAP. II.

Anasarca from Rheumatic Disease of the Heart..... 24

CHAP. III.

Anasarca from Enlargement of the Heart..... 40

CHAP. IV.

Cases of Anasarca occurring without organic Disease of an internal Organ—

1. From Cold applied to the Body 58
2. After Eruptive Diseases, especially Scarlatina 61
3. From Debility in young Females, with Suppression of the Catamenia, or succeeding to very large Discharges of Blood after Childbirth, or from Accident 68

Chap. V.

Page

Anasarca from Disease of the Kidneys 72

PART II.

Ascites, or Dropsy of the Abdomen—

1. From Contraction of the Liver after Inflammation, &c. 82
2. From Diseases of the Viscera supervening upon Ague 97

Chap. VI.

Ascites from Disease of the Peritoneum 101

APPENDIX.

ON THE CAUSES AND CURE OF DROPSY,

From the Original Italian of Dr. F. C. GEROMINI.

Chap. I.

Of the Theories of Physicians to the time of Brown, respecting the Causes which produce Dropsies; and also those of the great Anatomists who have illustrated (the structure and functions of) the Lymphatic System 115

Chap. II.

Of the sensible and well-known processes which produce an effect similar to Dropsy 135

CHAP. III.

Page

Of the Diseases which frequently precede and generate Dropsy 138

CHAP. IV.

Examination of the nature of the Fluid of Dropsy, and also of that which is naturally exhaled into the different cavities; afterwards of the Organic Alterations discovered in Dropsies 148

CHAP. V.

Of the Method of Cure pursued in all times, although not always in accordance with the different Theories of the Schools 161

CHAP. VI.

Explanation of the Cause of Dropsy, taken from the preceding Chapters 169

CHAP. VIII*.

On the false opinions commonly put forward, from errors of observation on the remote causes of Dropsy 173

CHAP. IX.

Examination of the thirst and wasting which accompany Dropsy. 184

* The Seventh Chapter is omitted, as consisting entirely of arguments against the Brunonian theory.

Chap. X.

Page

Explanation of the cure of Dropsy, derived from the reasoning in the preceding Chapter: reflections on that proposed by Cullen, by Milman, by Darwin, by Rasori; and examination of the "modus operandi" of remedies to promote it 194

Chap. XI.

The indications of the cure of Dropsy, derived from the opinions lately explained 210

ON DROPSY.

PART I.

ANASARCA, OR DROPSY OF THE SKIN.

THERE is perhaps no disease upon which Pathological Anatomy has thrown more light than upon Dropsy. This disease is now generally admitted, in its severest forms, to be a symptom of organic disease of one or more viscera of the body, in most instances arising from the return of blood to the right side of the heart being obstructed, and the impaired functions of that organ being relieved by the secretion of large quantities of fluid; the effusion being partial where the obstruction is partial, but where the obstruction is in the heart itself, sooner or later extending through the whole cellular texture. The ancient physicians, from their ignorance of anatomy, had contracted opinions that the liver was the principal agent in the formation of the blood, and hence to its disease all cases of dropsy were to be attributed: and when this idea disappeared before a more perfect knowledge of the

structure of the human body, each sect of physicians adopted some peculiar tenets of the school to which they belonged, to explain the causes of this fatal disease. These opinions will be found treated of at large in the Appendix, from the Italian of M. Geromini, who has investigated what may be called the history of the doctrines concerning dropsy, with singular labour, talent, and spirit: and as it is my wish rather to clear away than overload, I shall proceed directly to the object I have in view,—the arrangement, as far as it is possible, of these collections of fluid under their primary cause—disease of one or more of the viscera of the body.

It will be well first to glance at the ordinary manner in which most frequently cases of dropsy present themselves in hospital and private practice, which will demonstrate the necessity of the more detailed consideration of them.

How often does not the following case occur:

A patient, between twenty and thirty, or younger, applies for relief, having difficulty of breathing, increased on ascending a stair, or on rapid motion, with constant palpitation of the heart: he will relate that he has suffered from this palpitation for several years, on any hurry, but that latterly it has become constant; that he lies down

in bed with difficulty*, and that latterly his ankles and legs have begun to swell; he has constant thirst; the urine is high coloured; there is short dry cough, though he can inspire freely; his nights are restless; and when he wakes, his eyelids and cheeks are swollen: the pulse may be either quick and weak, or full and soft—rarely hard; the urine, on examination, does not coagulate by the admixture of acids, or by heat.

If further inquiry be made of the patient, he will be found to have been affected at some remote period, perhaps three or four years since, by acute rheumatism, with redness, swelling, and pain of the muscles and joints of the hands and feet, shifting their position from limb to limb, with fever; to have recovered from the attack, suffering more or less from palpitation; and to have become greatly alarmed at the recent appearance of the swelling: on listening to the chest, a noise resembling the blowing of bellows may be heard; the heart is felt beating over a large surface, and the dress worn about the throat is perceived to be agitated by the increased action of the organ.

The disease is enlargement of the heart after adhesion of the pericardium. The effusion or dropsy, in this case anasarca, is the consequence of

* This symptom is not constant.

the disease having advanced so far that the heart is unable to circulate its blood freely.

A man in the lower class of life seeks admission into a hospital under the following circumstances:—He is enormously swollen; the face, hands, legs, and integuments of the abdomen, hard, but retaining the impression of the finger; there is considerable difficulty of breathing, and hard dry cough; sometimes a little expectoration, frothy and tinged with blood; the urine is scanty, and does not coagulate by the usual methods; the pulse is hard, sometimes full; the heart is felt beating over a large surface; the tongue is often foul.

The disease is recent, and the patient still strong, but greatly oppressed.

If such a case prove fatal, the heart is found to be greatly enlarged; its parietes, especially those of the left ventricle and the septum, double their natural thickness, and the cavities likewise enlarged, but not in proportion to the increase of the muscular structure.

This is a case of enlargement of the heart from hard living, especially from drinking large quantities of porter. The patient is generally under fifty years of age. The dropsy is anasarca.

A woman, between 40 and 50, also applies for relief, with inordinate swelling of the whole body; but here the surface is not only distended and white, but the impression of the finger remains at considerable depth in the integuments: the pulse is quick and feeble, and even where there is volume it is easily compressible; but it is irregular, and there often is a grating sensation communicated to the finger. The urine is small in quantity, not very high coloured, but incoagulable by heat or acid. There is great difficulty of breathing, and often cough, with much mucous expectoration. The labia are enormously distended, and the parietes of the abdomen so much enlarged from infiltration, that, at first sight, ascites, or dropsy of the belly, would appear to be complicated with anasarca, but on striking the abdomen this is not found to be the case.

If this case prove fatal, the heart will be found greatly enlarged, but not in its muscular structure, or at least not in proportion to the size of the cavities; the enlargement arising from dilatation of the cavities, often also the valves do not shut perfectly from deposition of bone, and complicated with this is a dilatation of the root of the aorta, with atheromatous deposit.

This case of dropsy, then, depends on the disease of the heart, with dilatation of its cavities.

In all these cases there is a greater or less degree of congestion or condensation of the lungs. In the first case, from the disturbed circulation; in the second, from the action of the same intemperance which produced the disease of the heart; in the last case, infiltration of the cellular structure of the lungs is also present.

A patient, probably a young person, applies for relief, with swelling of the lower extremities and of the face; the pulse is not weak; there is pain in the back, sometimes in either hypochondrium, and headache; no enlargement of the heart is perceptible; no violent palpitation; no movement over a large surface; thirst; no dyspnœa; the urine is abundant and pale coloured, but on applying heat, or on the admixture of acid, a coagulation, varying from flocculi to nearly perfect coagulation, takes place.

If the patient die, the heart will be found natural, but the kidneys diseased.

This, then, is dropsy from disease of the kidneys.

These are cases of dropsy from disease of a single structure; but the causes which produced them, especially the inordinate use of stimulating liquors, may affect more than one. All the symp-

toms of dropsy from disease of the heart, with coagulable urine (or disease of the kidney), and with ascites from disease of the liver, may be present. Such cases are to be considered afterwards. By separating the cases of one form of dropsy from disease of a single organ, as it has occurred to me frequently to have seen them, from more complicated ones, we shall be better able to contemplate the history and treatment of those unfortunate cases in which universal dropsy takes place, as a symptom of the organic disease of several viscera.

In the following chapter I shall proceed to endeavour to explain more fully how the diseases of these viscera individually produce certain forms of dropsy, and the comparatively rare cases of dropsy from functional disease.

CHAPTER I.

The proximate or immediate cause of dropsy appears to consist in the secretion of fluid by the capillary arteries, nearly resembling the serum of the blood, more or less diluted, and in some instances approaching very nearly in consistence to the liquid secretion of lymph, which takes place at the conclusion, and is one of the terminations, of serous inflammation. Dropsies are generally considered under the head of—

Anasarca, or dropsy of the cellular membrane;

Ascites, or dropsy of the peritoneal sac;

Hydrothorax, or effusion of fluid into the cavity of the pleuræ; and Hydrops Pericardii, from effusion into the cavity of the pericardium;

Hydrocephalus, or effusion of fluid into the ventricles of the brain.

Anasarca arises most frequently—

1. From disease of the heart.
2. From disease of the heart and lungs.
3. From disease of the kidneys.

These are the organs which, being diseased either separately or together, are accompanied by an effusion of fluid, which appears to relieve the severity of the original disease at some period of its progress.

There is likewise a certain condition of the vessels of the skin (after cold suddenly applied to the surface of the body, or after the vessels of the skin have been long stimulated during eruptive diseases), in which the capillary arteries secrete a fluid precisely similar to that which is poured out as a relief to the congested vessels, in the organic diseases to which we have referred.

The simplest form of dropsy of the cellular membrane, is the swelling of a limb, or the extremity of a limb, without redness or heat, the part retaining, in a greater or less degree, the print of the finger impressed upon it, and the skin being white and shining: this is termed œdema.

This œdema is found to depend either upon tumours pressing upon the veins above the swelling, or obstruction of the vein itself. The first occurs, for example, in one leg, in ovarian disease, accordingly as the tumour within the pelvis obstructs the return of blood through the iliac veins, the minuter arteries secreting fluid, which

relieves the local congestion: if the tumour change its place, or the pressure be relieved by a horizontal position, the œdema disappears, or is greatly diminished.

The œdema which takes place from inflammation and consequent obstruction to a vein, is seen in the legs after lying-in, in the arm after phlebitis from bleeding, and often in a single extremity in those diseases termed malignant, or of a cancerous kind; where, on examination after death, the vein will be found obliterated above the swelling, often from a deposition of matter not unlike what is found in the diseased mass, the cause of the patient's death.

In every one of these cases the œdema is a symptom.

Wherever great obstruction exists to the return of blood to the right side of the heart, it would be fair to conjecture, from what we see in œdema in a single limb, that the whole venous circulation would be congested, and hence the whole capillary arterial system would secrete fluid, as a relief to the obstruction; and if this did not occur, the balance of the circulation would be in so disturbed a state as to cause rupture of vessels in some vital structure; and this we find to be the case: the capillary arteries pour out

fluid into the cellular membrane, of greater or less quantity, according as the obstruction is considerable, and of greater or less consistence as the patient's vital powers are greater or less, or the obstruction more or less sudden.

The œdema, in the first case, becomes now termed anasarca, or dropsy of the skin; the swelling is generally more in the legs, from their depending position, but the eyelids, cheeks, and integuments of the abdomen, are often greatly swollen, especially after sleep in a recumbent position. If the swelling pitted deeply on pressure, the skin being very white, and the forces of the patient broken, this condition was called by the ancients Leucophlegmasia; where the swelling was more tense and resistent, and strength less impaired, they employed the name Anasarca. As these are shades of the same disease only, I shall, for simplicity's sake, employ the latter term, as applicable to the whole disease.

Anasarca, then, is only a symptom of disease of an internal organ, with the exception hereafter to be more minutely described, in which the capillary vessels of the skin take on inflammatory action after cold rapidly applied. I shall proceed to shew, that in the majority of cases this form of dropsy depends on a disease of the

heart; reserving the cases of exception and their application afterwards. In these cases the heart is enlarged, sometimes with increase, sometimes with diminution of the thickness of its parietes. In such cases, when the valves are not diseased, the pulse is increased in frequency, and sometimes, not always, in force, and the heart is felt beating over a large surface. Such is generally the case in anasarca in young persons, in consequence of enlargement of the organ, subsequent to rheumatic inflammation, and adhesion of the pericardium. In anasarca from enlargement of the heart, at a more advanced period of life, the valves are also frequently diseased: if the semilunar valves be the structure principally altered, the pulse at the wrist is smaller, while the heart beats turbulently and over a large surface in the thorax; if the mitral valves be diseased, there is more or less of a grating sensation communicated to the finger on applying it to the pulse at the wrist, and in either case the pulse intermits. The same occurs as to the grating sensation, when the heart is enlarged, and very considerable alteration of the lining membrane of the aorta above the semilunar valves, with dilatation of that tube, is found; atheromatous deposit under the lining membrane, with portions of bone being also found on dissection. In both cases, but more especially the latter, the patient is subject to very severe paroxysms of pain, lasting for the

space of some minutes, hours, or even days, but alternating with intervals of perfect ease.

It is very remarkable, that disease of an artery may take place to a very great extent without dropsy occurring; while enlargement of the heart, unless death occur suddenly previously to the obstruction of the return of blood to the right side being considerable, is usually attended with dropsy during some portion of its progress. The effusion may indeed be got rid of by remedies, and the organs of the body, accustomed to the increased action, and greatly lowered in tone, still perform their functions, without a return of dropsy; but in such an instance frequently a few months only elapse before death, generally sudden, terminates the case.

The circumstance that the great arteries may be diseased to almost any extent, without dropsical effusion, while the heart, much enlarged, has its oppressed functions relieved by effusion, is of considerable advantage in diagnosis of diseases of this important viscus. The following is an example:—

A patient in St. George's Hospital laboured under considerable pain in the region of the heart, without expectoration, and with only short dry cough, ability to fill his lungs fully on inspira-

tion, and without pain. On inspecting the thorax, the heart was observed to beat very quickly, and somewhat strongly; its rapid motion being visible in the epigastrium, while the pulse in the brachial arteries was small, and there was no dropsy, neither had there been any effusion during the course of the malady. The extremely rapid and not weak action of the heart, combined with the weak pulse, appeared to me to denote that the heart was endeavouring to overcome some considerable obstruction to the circulation of the blood; produced by a tumour pressing upon the aorta, or by an aneurism. The case attracted considerable attention, and many gentlemen examined the chest very accurately; all believed the heart to be greatly enlarged, though much difference of opinion existed as to the presence of aneurism. My opinion was decided as to the absence of any except inconsiderable disease of the heart, because I had never seen a case with so much disturbance in the action of that viscus, arising from enlargement, without a greater or less degree of anasarca of the lower extremities.

About a year after the patient had been in the hospital, absorption of the ribs, at the posterior part of the thorax on the left side, took place; and a large aneurismal tumour appeared, which, after death, was found to have arisen in the de-

scending aorta, and to have caused absorption of the bodies of several of the dorsal vertebræ, but the heart was in an entirely natural condition.*

* As such a case is somewhat uncommon, I subjoin an accurate account of the post-mortem appearances, drawn up at the time by Mr. Cæsar Hawkins, Surgeon to St. George's Hospital.

The descending aorta was enlarged into an aneurismal sac, commencing about an inch below the left subclavian artery, and terminating close above the diaphragm, the communication between the aneurism and each extremity of the sound vessel being abrupt, and somewhat valvular by the projection of the sac at each end beyond the part, which was still of its natural size. This sac extended across the back part of the left side of the chest to the ribs, three of which were completely broken up into several portions, which were loose in coagula of blood; and another rib above and below these was carious, and partly dead, but not broken into separate pieces. The sac of the aneurism projected beyond the broken ribs, forming a considerable tumour behind the chest, and having the latissimus dorsi muscle in contact with it. On the right side of the chest, the aneurismal sac projected about three inches beyond the vertebræ, but did not reach the ribs. The front of the aneurism had the œsophagus in contact with it, and the sac was partly indented and divided into two portions by this tube; the pericardium and part of the right lung were also adherent to the sac, and on the left side the lung was in part adherent to the sac in the same manner, but appeared also in part to have been absorbed, so that the sac was in a measure formed by condensed lung, where the pleuræ were thus deficient. On cutting into the aneurism from the chest, it was found to contain chiefly recently formed coagula, but towards the left side, where the ribs had been destroyed, there was a good deal of solid coagulum in layers of some standing. On emptying out the recent coagulum, several of the dorsal vertebræ were seen to be extensively absorbed, and their surface

The dropsy which occasionally occurs in chlorotic females may be adduced as an exception; but, upon examination, it will be seen, that the languid condition of the heart's action from want of power gives rise to precisely the same condition, functionally, but in an inferior degree, to what arises from organic disease in the former instance. The heart is unable to impel the blood to the extremities, and the capillary veins neither receive nor transmit the blood with the same rapidity as in a state of health. Congestion of the venous system ensues; hence œdema of the ankles and legs, puffiness of the face, difficulty of breathing: symptoms which are removed by permanently increasing the heart's action by steel, and all the usual means of promoting the

exceedingly irregular and knotty, this appearance arising in part from the destruction of the bone and intervertebral substance, but in part also from the deposit of new bone on the exposed surface of the old.

The lungs were full of dark blood and frothy fluid, and there was a considerable quantity of bloody serum in both pleuræ and in the pericardium. The heart was slightly enlarged, the left side being a little thickened, while the cavities of the right side were enlarged, without any increase of muscular substance.

The ascending aorta was very much dilated, and its coats a little altered in structure; the centre of the anterior part of the sac of the aneurism was at the same time seen to be formed of the remains of the descending aorta, which was a good deal loaded with steatomatous deposit, the rest of the sac being composed of cellular structure, which had no definite separation from that part which was formed of the artery itself.

growth of the body—as exercise without fatigue, dry air, animal food, &c. The same condition arises after profuse bleedings or hæmorrhage. The obstruction of the circulation of the blood through the minuter branches of the pulmonary artery by disease, causes an inferior degree of congestion in the whole venous system. This is seen in cases of solidified lungs, either the result of inflammation, or obstruction from tubercles. The anasarca in this case is not so general as in diseases of the heart, for a portion of the blood still undergoes, from the extreme minuteness of the ramifications of the artery, the usual change; the alteration also has been slow, and the declining strength of the individual, from the injury of this important viscus, has enabled, in some degree, parts to accommodate themselves to the change; *i. e.* the blood is in less quantity, and the obstruction less considerable and sudden, than after enlargement of the heart itself: hence the dropsy is less severe, being confined to some degrees of œdema of the lower extremities for the general dropsy, and effusion of fluid into the chest.

When the heart is enlarged, with disease of the valves, anasarca is often present to a great degree, and the obstruction to the passage of blood through the aorta causes it to be thrown back on the pulmonary veins, and large quantities of fluid are secreted, to remedy this important congestion. To this the patient probably owes

his life, or at least the continuance of life during some considerable time; for without it, it is probable some of the larger branches of the pulmonary veins would give way, and the patient die of hæmorrhage.

Where the obstruction has continued, and the consequent effusion has been considerable for some time, the right cavities of the heart become enlarged; and at length the smaller vessels in the lungs pour out blood, often in large spots, to which condition the name of pulmonary apoplexy has been given, very improperly. In every case, well marked, of this disease, which has fallen under my observation, the mitral valves have been most extensively and chronically diseased; and in the beautiful plate by M. Cruvelhier, the disease of this valve is prominently displayed, as the cause of so extensive and fatal an alteration of structure in the lungs.

In many cases of extensive disease of the lungs, however, no dropsy is found. How is this to be explained? In such cases, expectoration takes place in a very copious degree; and this secretion constantly removed, and passing away from the mucous membrane, or from a false membrane in a vomica, affords the relief more safely to the congested circulation of the patient, than that which is effected by the effusion into the serous

cavities, or the cellular membrane in other cases*.

In these instances, therefore—consolidation of the lungs, by inflammation, or crops of tubercles—the œdema is only a symptom; and the same may be said to be the case of the hydrothorax occurring with extensive disease of the valves of the heart.

Frequent as is anasarca from diseases of the heart, (enlargement with adherent pericardium, after rheumatic inflammation in early life, and enlargement with deposition of bone in the valves, coronary arteries, or pericardium at the root of the aorta in more advanced age), cases of anasarca undoubtedly occur, independently of disease of this important organ, or of the lungs. This leads us to consider the two forms in which the vessels of the skin may secrete fluid, after causes applied, which produce inflammation.

(Cases from disease of the Kidney, afterwards to be noticed.)

These are :—

1. Anasarca from cold suddenly applied to the surface of the body.

2. Anasarca succeeding to eruptive fevers.

* In cases also of solidified lung from tubercles, even where the expectoration is not considerable, diarrhœa or colliquative sweats being often present, relieve the obstruction.

1st. After cold applied suddenly to the surface of the body, dropsy not unfrequently appears, and this without organic disease. It is sufficient to remember the extreme vascularity of the cutis, the extensive secretion of perspiration over the whole extent, the quantity of imperceptible halitus or perspiration from the surface of the body, amounting, in the best chemical and philosophical estimate, to twenty-eight ounces in the twenty-four hours, to judge that the impression of cold suddenly applied, checking this necessary secretion, would produce great mischief: the consequence would necessarily be, either inflammation of the vessels themselves, causing a secretion of lymph; or this process would be counteracted by an increased degree of secretion, or exhalation, in other parts of the body. And what in fact do we find to be the case? Most frequently when cold is suddenly applied to the surface of the body, diarrhœa is the consequence; increased secretion and exhalation is formed in the intestinal canal, and thus the repressed sensible or insensible perspiration is balanced, and no dropsy takes place. After cold suddenly applied, diarrhœa is common, dropsy rare; because the repression of the discharge from one mucous membrane is compensated by the secretion from another: and it is only when this fails to relieve, that this kind of dropsy takes place. Ordinary fluids failing to be secreted, which it is the func-

tion of these vessels to prepare, and no increased secretion taking place from the membrane, the relation of whose properties with the membrane covering the body is so considerable, the vessels secrete lymph, the whole cellular membrane becomes distended, and the swelling is less elastic, more resisting, the skin more stretched and shining, than in the cases where a slow relief is afforded to the obstructed venous circulation. The action of the heart and arteries is increased in force and frequency; the secretion of urine is diminished, and high coloured; the tongue is white; in fact, a feverish condition of the body is formed; blood drawn from the arm shews the buffy coat; there is intolerable thirst present; and the remedies, both indicated and effectual, are those which diminish the increased action of the heart and arteries, and control the secretion of coagulable lymph, viz. blood-letting and mercury.

In physics, it is sufficient for a cause to produce a given effect, and it is unphilosophical to seek for more than one given effect to proceed from a given cause. But widely different is the effect of any given cause upon a body composed of different structures, endowed with different degrees of vitality, and with different functions to perform; and it is the absence of this consideration which has made physicians resolve, that

a cause, absolutely, singly, and solely, can produce diseased function of vessels by inflammation, and inflammation alone. Thus Geromini and his followers have advocated the point, that as in inflammation of serous membranes, the vessels pour out lymph under an aggravated form of the disease, and fluid in a less intense degree of inflammation, as a blister, for instance, applied to the skin, causes an effusion of fluid, more or less approaching to lymph, from the inflamed vessels, this process is the sole one to which dropsy can be attributed; and hence that (which is the unfortunate deduction) to remedies for acute inflammation can its successful cure alone be attributed.

That capillary vessels in serous membranes, destined apparently to secrete a halitus, in order to lubricate the opposing surfaces, (Cotunnius long since proved by experiments on living animals, that this halitus did not coagulate; hence the fluid of dropsy is not the condensation of this exhalation, as was formerly supposed, but a new secretion,) secrete lymph or whey-coloured serum at the conclusion of inflammation, by which the tension and increased action of these vessels is relieved, is certain. That these vessels should not likewise secrete fluid, when the circulation is greatly obstructed, to relieve the congestion of the veins, appears to me altogether

hypothetical. If, indeed, a morbid effect could arise from one cause, and from that cause alone, the conclusion would be determined. But without entering into hypothetical considerations, it is certain that one and the same effect to all appearance, as far as the effusion of fluid is concerned, may be produced, by disease of the heart, by obstruction to the circulation in the lungs, by cold suddenly applied to the surface of the body, by disease of the kidneys, and by eruptive diseases; but the exciting cause need not necessarily be the same.

CHAPTER II.

ANASARCA, FROM RHEUMATIC DISEASE OF THE HEART.

THE subjects of this disease are generally young, and, with few exceptions, under forty years of age. It has occurred to me to see this disease in patients of nine years of age*: and the most severe case I ever saw, that in which the disorganization of the heart had proceeded to the greatest extent, terminated fatally at the age of thirteen.

A patient labouring under anasarca from rheumatic disease of the heart, has swelling of the cellular membrane, having begun about the ankles: the face is also swelled, especially the eye-lids; there is an expression of anxiety, even greater than in diseases of the chest in general; the pulse is generally small and quick, sometimes intermitting, but very small compared with the action going on within the thorax; a tumultuous beating of the whole organ: this smallness of the pulse compared with the violence of the

* A patient, in St. George's Hospital, suffered from rheumatic pericarditis at the early age of four years.

action in the heart itself, arises from the inordinate growth of the organ, without a corresponding enlargement of the vessels of the heart. In the most remarkable case of this kind I ever saw, the patient had laboured under the symptoms during four years, having commenced at nine years of age. The heart was enlarged to three or four times its natural size at his death, with repeated layers of lymph glueing together the pericardium : the aorta retaining the size of that vessel in a young boy of nine years. I have seen the same effect produced in adults, from contraction of the aorta above the semilunar valves. If the anasarca be very considerable, there is little pain felt in the chest, the obstructed circulation being relieved by the pouring out of the secretion from the minuter vessels. If the effusion be only commencing, there is almost always pain in the region of the heart, often pain in the course of the biceps muscle of the left arm, and cramps in the legs : the patient is unable to lie down, and the most easy position is bending forward over the back of a chair. There is also in the early stage a disposition to syncope.

If the effusion has taken place for some weeks, the pain and disturbance in the chest are less felt, and the patient attributes all his sufferings to the dropsy. The legs are tense; the face swelled, and of a pale bluish tint; great difficulty

of breathing; the urine very scanty and high coloured, and where unaccompanied by disease of the kidney, does not coagulate by the usual method; the pulse quick and weak; the surface of the body cold; there is present a short dry cough without expectoration, or with a very slight frothy expectoration, occasionally tinged with blood.

When a patient applies for relief, labouring under these symptoms, the first question to be asked is,—Have you suffered from rheumatism? or rather, as rheumatism in its ordinary sense is understood to apply to pains of all sorts,—Have you suffered from redness, swelling, and pain, in the limbs, confining you to bed? The answer is generally—About a year ago; or sometimes, two years ago. Occasionally the patient has experienced repeated attacks, or one very severe attack has preceded the symptoms by a few months.

In such cases the pathological appearances are uniformly, enlargement of the heart itself; the parietes thickened, especially those of the left side, and the cavities also larger than natural; the enlargement, however, not being in proportion to the increase in thickness of the walls of the heart; the pericardium is glued together by layers of lymph, often of old formation, and even organized, rarely (when life is terminated by dropsy) very recent.

In the notes of thirty cases, which I have seen in St. George's Hospital and the Seamen's Hospital, together with some in private, these pathological appearances have never failed to occur in a single case. In all such instances the account of the rheumatic fever which had occurred at a greater or less distance of time previously, was clear, distinct, and well ascertained. This form of dropsy from disease of the heart is perhaps the simplest view of the cause and effect; because it occurs in young people, before excess in the use of ardent spirits, or exposure to great changes of temperature, (the fruitful sources of diseases of the viscera), or before the advance of time has begun to injure the soundness of internal organs. Where diseases of the heart, terminating in anasarca, arise from the immoderate use of malt liquor, or ardent spirits, the same cause produces diseases of the liver, of the lungs, and often disease of the kidneys; and the anasarca is accompanied with ascites, and with all the evils of a digestion nearly destroyed. But in anasarca after rheumatism, the viscera are generally unimpaired; the alteration in the structure of the heart being the sole cause of the disease, which, from its striking appearance and distressing nature, is immediately looked upon as the principal one.

The prognosis of anasarca from rheumatic

disease of the heart, is always unfavourable ; but it is to be remarked, that the disease is often more chronic, even in its most severe forms, than dropsy from disease of the heart arising from other causes. 1st, Because the disease frequently occurs in young persons; and if the severity of it be relieved in the first instance, the growth of the chest enables the impaired action to be better borne. Thus I have seen the disease, in a most severe form, endure during five years. 2dly, Because not being the result of excess, spirit-drinking, &c. other organs have not suffered from a similar cause, as is so frequently the case in anasarca after such indulgences.

The treatment of anasarca from this disease of the heart, varies according to the degree of inflammation of the pericardium going on at the time of the effusion : if it has been immediately preceded by pain in the organ, and some swelling, redness, or pain in the limbs, inflammatory action undoubtedly exists, and the means to relieve it must be had recourse to. Blood-letting, not in any large quantities, and taken from the patient when lying in a horizontal posture, so as to relieve the organ, without producing fainting, (for it is to be remembered, if the patient faints he may not recover,) is the first remedy. To this should succeed the employment of calomel and opium, (than which no remedy, it is well known,

is more successful in arresting the progress of inflammation of serous membranes.) Three grains of calomel and a quarter of a grain of opium may be given every four hours : a blister may be applied over the region of the heart, and a strictly low diet enjoined.

It may here be remarked, that the quantity of mercury which may be administered with the greatest advantage, in this state of disease, (when inflammation ending in deposition of lymph is going on in the pericardium), is almost inconceivable to those who have not witnessed it, without affecting the gums, or producing any inconvenience whatever. It has occurred to me repeatedly to see from fifteen to twenty grains, in the acute form, given during ten days or a fortnight, without any affection of the gums, or any appreciable effect, except the relief of the symptoms: the breathing being improved, the anasarca disappearing, the sleep tranquil, and the pulse being restored to its regularity.

In this form of the disease, where blood-letting is useful, and calomel and opium most efficient in restraining the action of the minute vessels, the most useful diuretic, in my experience, is nitre : from ten to fifteen grains may be given in mint-water, twice daily. The quantity of urine secreted under this course, is sometimes

very great, and with the most manifest relief to the patient. The preparations of colchicum in dropsy arising from enlargement of the heart, the consequence of rheumatic disease, would naturally, both from their presumed specific power in rheumatism, and also from their diuretic effect, appear to be indicated, but I cannot speak favourably of their employment: on the contrary, great depression of vital power, with increased irregularity in the action of the heart, is often the consequence; and I do not remember any case in which benefit appeared to be derived from their employment. How unlike the effect produced by them in effusion into the joints, which caused them, under the name of Hermodactyls, to be termed by the ancients "Theriaca Articulorum !!!"

The above treatment applies to the cases in which dropsy has appeared consequent upon enlargement of the heart from rheumatism; the inflammation of the pericardium still going on in an inferior degree to that which originally existed.

I proceed to notice the treatment where the inflammatory symptoms have ceased; when the patient has for months laboured under effusion into the whole cellular structure of the body. The limbs, integuments of the abdomen, face,

and scrotum, are greatly swelled, the urine scanty and high-coloured; there is great dyspnœa; the pulse full, but easily compressible; and the limbs, which in the former case were swelled and hard, admitting the print of the finger only on deep pressure, are lax, white, and receive deep indentation from slight pressure. Here the great object is to unload the system by diuresis, and thus to relieve urgent symptoms; and here we may have recourse to the preparations of digitalis with the happiest effect.

Dr. Withering has remarked in the work which first formally introduced this medicine into practice, that it will be found most effectual in a lax state of the system, where the effusion is considerable, and the action of the heart and arteries feeble; and this, in my experience, is uniformly the case. The infusion of digitalis is the preparation most effectual as a diuretic, and it will, in the state of the system to which I have alluded, be found more frequently to succeed than any other. The formula which I have found more certain than any other, is the following:—

℞ Infusi Digitalis, ʒiv.
Liquor. Oxymur. Hydrarg. ʒij.
Aq. Menth. Sativ. ʒviij.
Træ. Cantharidis, ♏xxx. M. Fiat haustus bis terve in die sumendus.

The Tinct. Cantharidis*, in itself an active diuretic, renders almost every other more effectual; but it is contra-indicated in aged persons, where disease of the urinary organs is present. The rapidity with which the above draught operates, is quite astonishing: I have seen as much as a gallon and a half of urine voided in one night, after the second day of its employment. From the presence of the oxymuriate, however, it will sometimes purge—an effect to be prevented; for this purpose, a pill, consisting of a grain of opium, should be given every night, at bed-time. It is obvious that the enlargement of the heart continues, when the dropsy which relieved the obstructed circulation is carried off by remedies, and that the patient has a crippled existence; but in the more opulent classes of society, his life may be spared many years: not so with the poor man; he must return to the rapid changes of temperature—the originally exciting cause of the disease—and to all those circumstances which especially influence the diseased organ, viz. toil, anxiety, vexation, and want. Hence the numerous and unhappy relapses which are seen in hospital practice.

Anasarca, from the disease of the heart, also

* This subject, and that of diuretics in general, will be discussed in a subsequent chapter.

occurs from enlargement of this organ, from spirit-drinking, or the inordinate addiction to porter (common in this city), or from long-continued anxiety, and great mental distress. In the first instance, the heart is much enlarged, principally with increased thickness of the parietes of the left ventricle, and the septum between the ventricles: it occurs from twenty years of age to sixty, and is almost invariably attributable to intemperance.

The anasarca in this instance is enormous, the whole cellular membrane of the body being greatly distended; the integuments of the abdomen being increased to a size which appears at first sight impossible, without effusion into the abdominal cavity, and yet on striking the abdomen no fluctuation is perceived. In extreme cases, the distention is so great that the cutis splits into laminæ, giving the appearance of fine threads, dividing its texture transversely; at others, effusion takes place, in large blisters on the legs and extremities, which by bursting and discharging serum, for a time alleviate the distress. The pulse is generally strong and quick, the urine scanty and high coloured, and does not coagulate by heat, or the admixture of acid; the tongue is furred, the patient obliged to be raised in bed, and complaining of an insupportable oppression. The face is swollen, and often with a bluish tint, and there is constant thirst;

the bowels are generally natural in their functions, and the appetite little deranged.

Now, where such a combination of symptoms from such a cause arises, it is natural to look for the most obvious relief; and from the swelling and effusion occupying a continuous surface, to relieve it by scarifications; and, in fact, this is for the time very effectual: an incision of about two inches, just above each inner ankle, will reduce in a few days the enormous effusion, and the consequent oppression of the patient. I have seen two gallons of fluid discharged in three days from such incisions, and the dropsy entirely reduced, but in almost every *hospital* case, erysipelas first, and subsequently gangrene, supervened, and the patient died. Acupuncturation in dependent parts produces an inferior degree of relief, but with less danger—in hospital practice at least: I have seen this operation followed by erysipelas and gangrene, although far less frequently than in the other more decided and effectual practice.

Either of these modes of treatment, however, only relieves symptoms, and some remedy is necessarily sought for, which, while it expels the fluid, by increasing the natural excretions, and thus effecting a vicarious drain, may diminish the increased force and violence of the heart's

action. The first of these is the elaterium: this very important medicine may be used where the strength is yet unbroken, however great may be the oppression from the extent of the anasarca, and the relief has often been so great and so permanent as to induce physicians to believe that not only has the fluid, the symptom of the disease, been got rid of, but that the actually increased bulk of the parietes of the heart is diminished. Bloodletting should be premised, both with a view of unloading the congested venous system, and of promoting absorption: (it is well known from the experiments of Magendie on the injection of poisons, that their operation was greatly quickened by premising bloodletting;) and afterwards the elaterium should be given in the following formula, beginning with half a grain:—

℞ Elaterii*, gr. ½.
Subm. Hydr.
Pulv. Capsici, aa. gr. ij.
Conf. Ros. Canin. q. s. ut ft. pilula, mane sumenda.

* It must observed, that the elaterium is most applicable in cases where the bodily powers are yet strong. Thus I was more successful in its use, in cases in the Seamen's Hospital, where the patients were hardened by exercise, and inured to exposure, than in St. George's Hospital, where many of the patients are from a class accustomed to long confinement and little exercise. Improperly administered, elaterium is apt to produce a diarrhœa, from which the patient never recovers.

Dr. Cullen used very successfully three grains of gamboge with sugar, every three hours. Such practice, though it produces frequent watery evacuations, is very inferior in power to the elaterium.

Such a form will operate very frequently by stool, producing many liquid evacuations, and accompanied for the most part by severe bilious vomiting, the effect of which, as is well known, is to produce a very active state of the absorbents. Thus Forestus speaks of an ascites cured by sea-sickness; and the recession of tumours, under the action of vomiting, has long been ascertained.

It is very remarkable how much oppression in such cases imitates true debility.

It occurred to Dr. Chambers and myself to be called to a patient who laboured under enlargement of the heart and great vessels: the effusion consequent on the former had been repeatedly removed by remedies, but had returned to so great a degree, that he had been three days in making a journey of sixty-five miles; and his medical attendants had hesitated as to very small quantities of purgative medicine. On the evening of his arrival in London, he was bled, had his scrotum punctured, and took elaterium, which was repeated every alternate day for several weeks, with the decided advantage of undoubtedly prolonging his life.

When this remedy fails, or when it ceases to have the desired effect, I have succeeded in a

manner which has greatly pleased and surprised me, in evacuating the fluid by large doses of cream of tartar. Small doses of this salt are among the most popular remedies for dropsy, increasing the flow of urine, whether as a beverage with lemon peel and ginger, under the name of Imperial, or with gin and sugar made into a kind of punch, whose diuretic properties are undoubted. But about seventy years since, Menghini, an Italian physician, recommended this medicine in far larger doses, as a deobstruent, and averred that he had cured many cases of dropsy by its exhibition*.

* The principal cases related by Menghini, are those of ascites after diseases of the liver and spleen, maladies very common in Italy. The following, however, is one of the casea similar to those in which I have seen this remedy more effectual; and it is also a good specimen of the manner in which these diseases are described.

I have little doubt that the patient laboured under disease of the heart, with dilatation of the aorta, which gave rise to the "asthma primo convulsivum tum humorale," described in the case.

"Invaserat mulierem quinquagenariam, biliosam, et habitus corporis macri, et rigidi, asthma primo convulsivum, tum humorale, cujus causa repetenda videtur a longiore mora in frigida, ut lintea lavaret. Cum hunc morbum plures menses tulisset, tandem die quarto Junii, annii 1755, se in Nosocomium recepit. Quæ emolliunt, incidunt, et urinas blande proliciunt mensem unum fuerunt utiliter adhibita. At *decrescente paulatim respirandi labore*, aggrediebatur sensim œdema primo pedes, tum crura, deinde coxas postremo et faciem. Hæ partes quin et abdomen sex dierum spatio, ob vesicam et

He recommended an ounce to be taken every morning in water; the salt requiring about thirty parts of boiling water for its solution; and states that patients recovered with the use of no other remedy: he adds, that the urine let fall a sabulous deposit at the time. Dr. Home, in his clinical experiments, has related a very large number of cases cured by Menghini's method. But as the organic disease is very different in different cases, as a glance at the histories will determine, no scientific deduction can be drawn as to which kind of dropsy, or to what disease of organ, the remedy is especially applicable.

The tartaric acid, united with an alkaline base, has always been considered, for reasons which I am unable to explain, especially applicable in dis-

alvum segnius fluentem supra modum tumuerunt. Hinc Sitis non modica, vigilia, cibi fastidium. Venter, *tametsi summopere distentus,* percussus tamen aquam intus absconditam non accusabat.

"Cum hæc sic essent, spem non levem habui de Tartaro: quam auxit tum celer corporis totius tumiditas, tum conjectura de aquæ absentia in ventris cavitate. Jam ergo non quemadmodum alias tartari drachmæ quatuor, sed binæ tantum singulo die dantur. Arbitratus quippe sum remedium licet parcius, tempestivè tamen datum eodem liberalius, ut serius dato, plus profecturum. Et sanè res bene cessit, nam alvo prompte et pluries obsequente, et urinis crassis, sabulosis et ad uncias aliquando octoginta fluentibus, universus corporis tumor dierum quindecem spatio, nullo superstite, respirationis vitio, omnino desedit." — *Vincent. Menghini Instituto Bononiensi.* Vol. iv. page 277.

eases of the liver. The tart. potassæ especially was considered as a deobstruent in bilious obstructions, and the sulphate of potash in glandular obstructions: hence for ascites depending on disease of the liver, it would be reasonable to choose this remedy; but, in my experience, it is in anasarca from disease of the heart that this method proposed by Menghini is most effectual. I have repeatedly succeeded, even where elaterium has failed in removing the dropsical effusion, by this method. An ounce of cream of tartar is directed to be taken every morning in solution, or if this acts too violently by stool, half an ounce will be sufficient. After the fourth day its beneficial effects generally commence.

CHAPTER III.

THE next case of anasarca from disease of the heart, is where this organ is greatly increased in size, with attenuated parietes. Such cases occur in constitutions broken by habitual intemperance, or debilitated by affliction, long-continued anxiety, great watching, and sometimes after long-continued and profuse evacuations—more frequently in females than in males; and the disease is more common in advanced age than the other forms of anasarca from disease of the heart.

The pulse is weak, often irregular; at least, even where there is volume, it is very compressible. The anasarca, which is very extensive, takes more the form of what has been termed leucophlegmasia: the face is swelled, and of a ghastly white appearance, while the integuments pit on the slightest pressure. The effusion is always preceded by difficulty of breathing, especially on any quick motion, by violent palpitation, and disposition to syncope. The difficulty

of breathing is not, as in the former instance, much relieved at first by the effusion; for not unfrequently the cellular membrane connecting the lobules of the lungs is infiltrated also.

It is in this form of dropsy that sudden death frequently occurs. The patient may be apparently doing well, the swellings gradually receding, when a sudden return of effusion, either into the chest or pericardium, is followed by almost instant death.

This form also is often complicated with dilatation of the arch of the aorta, and deposition of atheromatous matter with spicula of bone under the lining membrane. In such cases there are not only all the evils arising from oppression and distention present, but also paroxysms of most severe pain, similar to what is experienced in ossification of the coronary arteries, and is termed angina pectoris.

It is in this form of the disease, where the tone of the system is much impaired, that the preparations of digitalis as diuretics are most effectual; and it is in their application to this condition, that Dr. Withering's original observations on the use of this medicine are borne out in their full force and accuracy.

" 1. It seldom succeeds (says Dr. Withering) in men of great natural strength, of tense fibre, of warm skin, of florid complexion, or in those with a tight and cordy pulse.

" 2. If the belly in ascites be tense, hard, and circumscribed, or the limbs in anasarca solid and resisting, we have but little to hope.

" 3. On the contrary, if the pulse be feeble and intermitting, the countenance pale, the lips livid, the skin cold, the swollen belly soft and fluctuating, or the anasarcous limbs readily pitting under the pressure of the finger, we may expect the diuretic effects to follow in a kindly manner."

This medicine may be combined with squill and mercury, as in the pil. hydropica, (pil. hyd. gr. iij.; scillæ exsicc., pulv. fol. digitalis, aa. gr. i.) or in infusion with the liquor. oxymur. hydrarg. in mint water; and if the patient labour under no disease of the bladder or urethra, with the tincture of cantharides.

To the addition of this medicine the tincture of cantharides (as I have before hinted) to the infusions of digitalis, of spartium, or of pyrola umbellata, I am convinced, by repeated expe-

rience, the most complete diuretic effect is to be attributed. I had, indeed, read that Dr. Wells had succeeded in producing diuresis with the tincture of cantharides, in three cases out of five, in dropsy, with coagulable urine, but I was first led to employ the preparation after a consultation with Sir H. Halford, on a case of hydrocephalus.

That experienced physician related two cases of this most fatal disease, which he had seen, after the stage of effusion was established, recover, in consequence of a very abundant diuresis ensuing on the administration of the tincture of cantharides. Hence I added this preparation to the infusions of diuretic vegetables; and have succeeded more uniformly in expelling the fluid with the infusion of digitalis, combined with oxymuriate of mercury, with the addition of tincture of cantharides, than with any other diuretic preparation I have used, or seen used, in my experience.

This leads me to say a few words on the internal use of this very important preparation, not only in this but in some other serious diseases.

Cantharides have been recommended from very high antiquity, and have been employed, and

afterwards laid aside or neglected, partly from their irritating effects when they are incautiously exhibited, and partly from their partaking of the uncertainty of all diuretic medicines, (Dr. Wells's cases might well have awakened a spirit of inquiry,) partly because of the condemnation of Dr. Cullen, who says, "they failed certainly in the hands of Dr. Carmichael Smyth, who asserts that, in his frequent exhibition of the tincture of cantharides, he never once observed the secretion of urine increased."

In modern practice they have been recommended by Cloquet, who believes that in substance the cantharides produce strangury, but in liquid are diuretic. In aged people, and those labouring under any disease of the prostate or of the mucous membrane of the bladder, I fear it will be found that in tincture, as well as in substance, the cantharides produce this very painful consequence.

It may be here permitted also to make a few short observations on the great influence which this medicine exercises over certain cases of paraplegia.

I have succeeded beyond my hopes in restoring the use of the limbs in early life in this dreadful

disease. It has been long known to be useful in such cases; and in pressing it upon the consideration of the profession, I am advocating no very novel practice, though the successful cases are scattered though different works. In all the cases in which I have seen its administration effectual, it has acted as a powerful diuretic; and if Dr. Baillie's opinion be correct as to one of the causes of this disease, ("if there be any effusion of serum between the membranes of the brain, which is a very common occurrence, a portion of the serum may fall into the cavity of the theca vertebralis, and press upon the lower part of the spinal marrow,") this diuresis will sufficiently explain its utility in the palsy of the lower extremities.

The following cases are remarkably striking ones:—

William Mowland, æt. 29, was admitted into St. George's Hospital, July 22, 1835, affected with palsy of the upper and lower extremities: two years before he had suffered from paralytic affection of the hands in a less degree. On admission, he was unable to stand, or feed himself; his intelligence was entire, but all movement of the extremities suspended; the sensibility in the lower limbs was likewise impaired; his appetite and digestion nearly natural; he passed his stools

and urine at times involuntarily; his sleep was much disturbed. Pulse 80; tongue clean.

I ordered strips of blistering plaster to be applied to the spine, and the vesicated surface to be dressed with mercurial ointment, being the most effectual practice in palsy with which I was acquainted: his bowels were also ordered to be kept open. This treatment was repeated three times, and some increased degree of power over the lower extremities appeared to be the consequence; but as the case did not progress, I requested a consultation with my friend and colleague, Dr. Chambers: it was agreed to give him the tincture of cantharides.

On the 28th of August, thirty minims were ordered to be taken thrice daily, in water.

In two months, during which the practice was never varied, he recovered the entire power of his limbs, and the sensibility returned: the extensor muscles of the fore-arms alone remained disobedient to the will. (He had never worked in lead.) Splints were ordered for these. In four months from the beginning of the disease he was able to walk out, and to help himself, weakness only of the extensor muscles remaining: at this time a slight strangury came on; and it is remarkable that this did not occur until the dis-

ease, for which the cantharides was prescribed, had almost entirely ceased. Camphor, and the use of the warm hip-bath, relieved the symptoms. He remained in the hospital during the winter, in order to test the permanency of his cure, and left it quite well in March 1836.

Henry Mansell, a prize-fighter, æt. 22, was admitted, in the winter of 1834-5, into St. George's Hospital, after a pugilistic match, in a state which gave reason to believe he suffered from concussion of the brain. He recovered his senses, but remained paralytic of the hands and legs. He was unable to stand; and in order to move from place to place, crawled forward, shoving himself onward with one leg, as children do when first learning to walk: the sensibility in the legs was almost destroyed. He was during some weeks under the care of Sir B. Brodie, who relieved the affection of the brain arising from the accident: subsequently he was transferred to my care. He had used full doses of strychnia without the least benefit: all the animal functions were natural, (pulse 60.) I ordered him to be cupped once in every fortnight, from the nape of the neck, and blisters to be applied in succession over the spine, and dressed with mercurial ointment. Great relief was afforded by this treatment: he recovered the use of his arms and

hands, and greatly increased power over the lower extremities. At this time I ordered him the tincture of cantharides, as in the former instance, and very rapid progress was made. In less than a month he was enabled to walk well on crutches; and so satisfied was he with the hope of ultimate recovery, that he left the hospital at his own desire.

The recovery in this instance was preceded by creeping pains along the course of the spine and in the limbs, occasionally very severe: they were relieved by the sp. ammon. succinat. in camphor mixture: these pains exactly resembled at times the aura epileptica.

I have seen one more case recover under this treatment: and there is one other case now in the hospital, under the same course, with every prospect of success.

MM. Merat and Lens, in their beautiful work on the Materia Medica, wind up their observations by the following remark on cantharides, to the truth of which I entirely subscribe:—

"Mais c'est en teinture surtout qu'elles sont bien indiquées: c'est dans ce cas un des moyens à la fois les plus efficaces, et comparé à la plu-

part de ceux qu'on y emploie, les moins redoubtables*.

The nitrate of potass in solution, in the dose of fifteen grains; the acet. of potass, in the dose of from one to two drachms, either in its usual form, or made by neutralizing in solution the carbonate of potass with the vinegar of squills†; may be given in a draught, with a pill, consisting of three grains of the blue pill, several times in the day; or a kind of punch may be given, made with cream of tartar instead of lemons, to every pint of which two ounces of gin may be added: all these are very effectual diuretic drinks. The latter is very convenient in hospital practice.

The spirit of nitric æther may be added, in the dose of a drachm, to a draught containing ten grains of nitre dissolved in mint-water; or it may be given as a beverage in the proportion

* Dictionnaire de la Matière Médicale; Art. *Meloe vesicator.*

† The following was a favourite prescription of the late Sir F. Milman:—

℞ Aq. Menth. Virid. ℥j.
Aq. Puræ, ℥ss.
Carb. Potass, gr. xv.
Aceti distill. ℥vj.
Aq. Pip. Jamaic., Syrupi, Aceti Scillæ, aa. ℥j.
M. ft. haustus.

of two drachms, or two drachms and a half of æther, in six ounces of water: in this latter form it is not disagreeable.

The spirit of nitric æther, the compound spirits of horse-radish or juniper, can scarcely be given in sufficient quantity to have any decided effect; but they may be used in private practice, as "adjuvantia."

As the disease advances, if no advantage be obtained from the remedies mentioned, the patient or his advisers seek, from the long list of diuretic remedies, other means to get rid of the fluid.

The preparations of squill, when combined with mercury, are better adapted to cases where blood-letting is necessary, because this medicine by its nauseating properties diminishes the force and power of the heart; but in the case we are considering, there is increased action with diminished power. Dr. Withering recommends the employment of squill in those cases in which, from the strength of the pulse, the recent nature of the disease, and the youth of the patient, little is to be expected from the diuretic effects of digitalis. Another difficulty presents itself in some cases—that extreme irritability of the stomach is induced, thus prohibiting the practitioner from the use of nearly all internal medicines. This

has not escaped the observation of the French and Italian physicians; some of the latter, especially Brera and Chiarenti, recommend the employment of this remedy in friction, and speak of its decided success. I have employed this mode of administering the squills in the wards of St. George's Hospital, and would speak with diffidence of the result of a very few cases in which it was ordered. Half an ounce of the dried powder of squills was mixed with double the quantity of hog's-lard, and a drachm rubbed in thrice daily over the abdomen and the inside of the thighs: this was only in cases in which the extreme irritability of the stomach prevented the administration of the ordinary preparations of this plant. Of the inunction of Veratria ointment, as recommended in recent publications, I have little experience; in the few cases in which I employed this most expensive remedy, no advantage was derived from its use.

Of the hydriodate of potass as a diuretic, I cannot speak favourably in my own experience; the value of this medicine, in another form of dropsy, will be referred to hereafter.

The school of Montpellier long since exploded the popular, but most erroneous, doctrine, that drinking freely was injurious to dropsical patients—an idea as old as those Grecian schools of physic which recommended spices and wine

as corroborants in this disease; and sometimes exposed the patients to the ardent rays of a southern sun after covering him with ointments made of honey, lees of wine, and other stimulant preparations, with a view of drying up the superabundant moisture.

The most celebrated remedy for dropsy in France before the Revolution*, appeared to owe a large part of its efficacy at least to the copious draughts of weak beef-tea (*bouillon*) ordered during its administration. The pills themselves, each of which contained half a grain of a drastic purgative (the extract of black hellebore), were given six at a time, early in the morning, and repeated at midday, the patients drinking copiously during the operation; but the author of this method, either unable to withstand the doctrines of the humoral pathologists with whom he was surrounded, or willing to persuade, rather than argue with the world at large, and their popular idea of debility, called his pills, the basis of which was a drastic purgative, increasing all the secretions, by the name of "Pilules Toniques." In my experience, the pills of Bacher are infinitely inferior in power to elaterium.

* Bacher's pills consist of half a grain of extr. hellebori nigri, half a grain of myrrh, and nearly half a grain of the powder of the card. benedictus: the infusion of the latter plant is a feeble but popular diuretic.

It is now about twenty-five years since Dr. Somerville, sen.* made known generally the powerful effects of the pyrola umbellata as a diuretic. It has not been sufficiently employed to enable us to determine to what cases its administration is particularly adapted. In very languid cases of anasarca, where the swellings are of long standing, and other remedies have failed, I have been agreeably surprised by seeing a full flow of urine established, and great relief afforded. It is best administered in infusion, an ounce of the leaves and stalks being infused in a pint of water, which should be drunk during the day. It sometimes irritates the urinary passages violently, and should therefore not be used in cases of advanced age, or where the patient has suffered from stricture.

The infusion or decoction of the twigs and stems of the spartium scoparium has long been a remedy adopted in the country to produce diuresis. It may be given in decoction, an ounce of the broom tops being boiled in a pint and a half of water to a pint, and mixed with an equal quantity of hot milk, or in infusion, as common tea. It has appeared to me to be more useful in the convalescence of patients than early in the disease, keeping up a diuresis already established, and promoting the general strength of the patient.

* In the Med. and Chir. Transactions.

Sydenham recommends the ashes of this plant dissolved in white wine; and, latterly, the seeds have been greatly recommended in Germany in similar cases, a drachm of them being taken twice daily in two ounces of white wine. I have only seen this remedy employed in two cases, and in both without the smallest effect.

The allium sativum (garlic) has been very strongly recommended by the most competent authorities in dropsy, especially in anasarcous swellings which *accompanied asthmatic complaints*,—cases in all probability arising from enlargement of the heart, with dilatation of the great vessels.

Forestus, Sydenham, and Cullen, all speak in the highest terms of this remedy. Two or three cloves are recommended to be swallowed several times in the day. It has occasionally in my experience proved grateful to the stomach, but not effectual as a diuretic.

The flowers and stalks of the apocynum cannabinum, or white hemp, were, a few years ago, recommended from America as a most powerful diuretic. I employed this herb in infusion in two cases of dropsy, in St. George's Hospital; but it proved in both far inferior either to the digitalis or the pyrola, in promoting the flow of

urine, and in one case produced much distress and vomiting, with a weak and irregular pulse.

The application of cabbage-leaves to the calves of the legs in anasarca, is sometimes attended with a considerable discharge of serum from the skin: the effect may be rendered more certain by rubbing the anasarcous legs gently with volatile liniment previous to the application of the leaves.

Looking to the observation of several years in these cases, I should say by far the most effectual diuretics stand in the following order of utility:—

Infusion of Digitalis with Tinct. Cantharid.
Nitrate of Potass.
Supertart. of Potassæ with Sp. Juniper. C.
Pil. Hydrarg. Pulv. Dig. et Scillæ exsicc.; in form of pill.
Acet. et Tinct. Scillæ.
Infus. Pyrolæ Umbellatæ.
Infus. Spartii.
Sp. Ætheris Nitrici.
Sp. Armoraciæ Comp.

If the swellings in such a case be of recent date, such means will often suffice to carry off the water by diuresis, and careful attention to the diet, which should be nutritious but not sti-

mulating, carriage exercise, pure air, and abstinence, as much as possible, from harassing and anxious occupations, will sometimes, for years, prolong the patient's life; but where the swellings are of many months continuance, little is to be expected except relief. Even here, life may be prolonged for a considerable time, under the most unfavourable circumstances, among the opulent. Not so with the poorer class of patients, in whom, in this country, intemperance has been the most active cause of their malady: when relieved of the fluid, which they consider to be the disease, they speedily return to spirit-drinking; and if there be yet power in the system to secrete a sufficient quantity of fluid, they are again affected by their former swellings.

It sometimes happens that after a long and very unsatisfactory course of treatment, with little effect in reducing the swellings, and thus relieving the oppression of the patient, the fluid, after the administration of some trifling remedy, begins suddenly to subside, with a rapidity equally astonishing and cheering to the patient: his attention being always fixed upon the dropsy, the symptom of the disease, he feels delighted at getting rid of what he considers to be the whole malady.

Such subsidence of the effusion in dropsy, un-

preceded by a gradually increased flow of urine, or by the use of remedies calculated to produce evacuations, and which by being administered during a long period, hinder, at least for a time, the re-collection of the fluid, is a very fatal symptom; the vital powers are no longer sufficiently strong to afford relief to the obstructed circulation, secretion from the smaller and more minute vessels no longer relieves the labouring heart. In several cases which have fallen under my observation, the patient has never rallied after this sudden subsidence of the effusion beyond a month: but I have heard of life being prolonged somewhat longer. A case of this kind is to be found in the experience of the late Dr. Parry, of Bath*. In the hospital I have had several opportunities of pointing this out to the pupils. It is an additional proof that dropsy is only a symptom, and for the time a relief: if the relief can no longer be afforded, from the diminished vital powers of the patient, he sinks, either apparently quite worn out, or from the rupture of a vessel within some important viscus—as the stomach, lungs, or brain.

* See Dr. Parry's Posthumous Works, page 191, vol. i.

CHAPTER IV.

CASES OF ANASARCA OCCURRING WITHOUT ORGANIC DISEASE OF AN INTERNAL ORGAN—

1. *From Cold applied to the Body.*
2. *After Eruptive Diseases, especially Scarlatina.*
3. *From Debility in young Females, with Suppression of the Catamenia, or succeeding to very large Discharges of Blood after Child-birth, or from Accident.*

The first case, dropsy from sudden impression of cold, is not of very frequent occurrence. Cold and wet acting suddenly, or for a length of time, on the surface of the body, more frequently produce inflammation of internal viscera, as of the bowels or lungs, or diarrhœa; but in some cases, after sudden exposure to cold and wet, the whole cellular membrane of the body becomes infiltrated, the swelling is hard and tense, the pulse hard, the urine very scanty and incoagulable* by heat or acids, the heart beats without symptoms of

* This is generally the case, but in some instances the urine coagulates slightly, a symptom which disappears by the treatment which relieves the dropsy. The coagulability of the urine

organic disease, though its action is increased, the bowels are costive, the effect likewise follows very rapidly on the cause applied; the patient's health has been good. There is in this state a general feverish excitement; the vessels of the skin, over the whole surface of the body, secrete serum, and the mucous membrane is deprived of the natural secretion which these vessels pour out in a state of health.

The indications of cure are to diminish increased action, and to restore the secretions, especially those of the mucous membrane of the bowels, both as revulsive and because of the great sympathy which exists between the membrane which covers, and the membrane which lines, the viscera of the body.

The patient should immediately be bled, and the blood drawn in such cases is almost invariably, in my experience, buffed and cupped. The next most important remedy for inflammation, calomel and opium, should be resorted to; three grains of the former, and one of the latter, being given morning and evening, and a saline draught three or four times in the day: every second morning the bowels should be freely opened with

in such cases has not been accompanied by alteration in the specific gravity of this secretion, as in cases where the structure of the kidney is diseased.

senna and crystals of tartar; two ounces of the former dissolving about two drachms of the latter. The cure of this form of disease will generally be perfected in about ten days; but the patient should not be dismissed, or exposed to the air, thus early, but, as a matter of precaution, retained in the hospital, or confined to the house, a few days longer.

The pathology* of the anasarca which succeeds scarlet fever is not well understood†. That it is seldom fatal I am fully convinced, notwithstanding the observations of De Haen and others‡, and by comparing epidemics with those of former years, it appears to be far less frequent than formerly, as a consequence of dropsy.

Various also have been the opinions of the

* We need scarcely proceed further, to demonstrate the truth of this observation, than the opinion of Dr. Frank:—

"Cette hydropisie aiguë peut dépendre d'un état inflammatoire manifeste, reliquat de la scarlatine, de la débilité, ou elle laisse dans l'économie de l'irritabilité excessive du système lymphatique, et même de l'état spasmodique de la peau; enfin, des saburres; mais le plus souvent de la suppression la transpiration."—*P. Frank, Traité de la Pratique de Médecine,* tom. ii. page 661.

† Ex hoc consectareo plures morruntur quam ex morbo primaeco.—*De Meza,* tom. i. 59.

‡ Plenciz and others.

treatment to prevent so unsightly and protracted a disease. The French and Italian physicians attribute its origin to the impression of cold air on the surface, and religiously keep the patient secluded in a closed apartment for forty days: should dropsy supervene, it is invariably attributed to some too slight observance of this rule.

The cold practice in this disease, universally pursued in Britain, and which is rarely followed by anasarca, is the best answer to such an explanation; the same may be said of the opinions which attribute this form of disease exclusively to weakness.

Almost all eruptive diseases are followed by a diarrhœa*, supposing a mild case little interfered with by remedies. Small-pox, measles, and scarlatina, frequently conclude with an attack of this nature. It appears to me that this points out the real condition of the disease: where saline purgatives are freely used throughout the disease, the means are effected by which nature terminates the cure. I have seldom, if ever, seen the anasarca supervene where this class of re-

* It is remarkable also, that an habitual diarrhœa suppressed will often be succeeded by anasarca. Several cases are related in Portal's work *Sur l'Hydropisie.*

medies was freely used, especially towards the decline of the disease.

There is a passage in the work of the late Dr. Hamilton, of Edinburgh*, on this subject, very striking, and which I have seen fully borne out in observations in various hospitals both at home and abroad. Now French and Italian physicians, as it is well known, employ purgative medicines in such diseases very sparingly; confining themselves to the use of enemata, or the mildest purgatives: hence, in my opinion, the frequency of anasarca after scarlet fever, compared with the same in this country.

It is fair, however, to say, that these views do not coincide with those of many old physicians. Dr. Willan says—

"Practitioners in this country have generally "found the dropsical symptoms yield to diuretics, "combined with Peruvian bark, preparations of "iron, or calomel. I do not mean to infer that my "countrymen are successful, in this stage of the

* Dr. H. lost three patients in Heriot's Hospital, during an epidemic of scarlet fever, by the dropsy, which followed the disease. In the many cases which succeeded these, he employed purgatives fully at the decline of the fever, and in no instance did the dropsy occur.

" disease, by any peculiar practice. If they have " had more success in the treatment of scarla- " tina, than physicians on the continent, I would " ascribe it to the general disuse of *bleeding and* " *purgatives* during the last thirty or forty years, " within which period gangrene and dropsy have " been with us much less frequent occurrences " than formerly."

The dropsical swellings in every case attended by Dr. Rush, were removed by doses of calomel and opium.

It is remarkable that dropsy by no means supervenes in proportion to the severity of the disease. A very slight febrile attack is sometimes followed by it; and I do not remember, among the very worst cases of a low type, to have ever seen one terminate in serous effusion.

It is remarkable also that in the celebrated work of Dr. Fothergill on this disease, no mention whatever is made of dropsy as a sequela of scarlatina maligna, in those who escaped the first severity of the disease.

Though anasarca is by far the most frequent, and, in my opinion, the least formidable kind of dropsy which supervenes on scarlatina, ascites, hydrothorax, and hydrocephalus, also occur. It

is, however, to be remarked, that all these forms of dropsy are more tractable than in ordinary cases, because they are not dependent on disease of structure. I do not here, however, allude to the occasional occurrence of purulent effusion from inflammation of the serous membranes of the chest (empyema); happily a rare, but, I believe, always a fatal disease, when it occurs during the course or at the conclusion of scarlatina.

The following case is illustrative of two points in the foregoing observations: that these effusions are by no means necessarily preceded by a severe form of scarlatina; and secondly, that they are more curable than ordinary cases, because less frequently connected with structural disease of internal viscera.

A married woman, aged thirty-six, was admitted, some years ago, into St. George's Hospital, under my care, with a slight attack of scarlatina: the efflorescence was bright, continued three days; the throat was slightly ulcerated; and the cuticle desquamated as usual. During the efflorescence she was sponged with cold water and vinegar; the bowels were freely opened; first, fomenting gargles, and subsequently astringent ones, were used to the throat, and the case proceeded to convalescence readily. At the expiration of ten days she appeared to be

quite well, and remained only in the hospital as a precaution against taking cold. About the fourteenth day from the commencement of the disease, she was suddenly attacked with pain in the head, loss of speech, followed by paralysis of the sphincters, dilatation of the pupil of the eye; all which symptoms were formed in the course of a day and night. The pulse was quick and small, and there could be no doubt of effusion having taken place into the head. She was ordered to be bled to sixteen ounces; two grains of calomel were put upon the tongue every three hours; and a blister applied to the top of the head, and kept open with mercurial ointment; half an ounce of the infusion of digitalis being put down the throat with a spoon, the intermediate four hours.

Under this treatment she gradually recovered: first the involuntary discharges were repressed, consciousness returned, but the faculties of the mind remained in a very strange state. The patient was precisely in a similar condition to that of one who is recovering from a violent concussion of the brain. She understood all that was said to her, but could not remember the words to express her answer. Thus, when asked what o'clock it was, she explained herself by signs, not being able to remember the words: subsequently she used words, single, and unconnected

by articles, so as to express her meaning, but not in a sentence. By degrees this power of expression returned; she was quite well at the end of a month, and two years afterwards I again saw her in perfect health.

Anasarca, after scarlatina, begins generally from the fourteenth to the eighteenth day after the commencement of the disease—sometimes gradually, sometimes within the space of a very few hours; the patient is enormously swollen, so that the eyes are closed; the countenance white, shining, and swollen to an enormous extent; the secretion of urine of a deep colour, and in very small quantity. In many instances the urine is mixed with blood, and in such cases coagulates. (See a paper by Dr. Wells, in the first vol. of the Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge.) There is thirst, a furred tongue, and even, on the onset, heat of skin; sometimes, but rarely, difficulty of breathing and headache: the integuments of the abdomen as well as the scrotum, and the rest of the cellular membrane of the body, are anasarcous in the highest degree.

If the preceding fever has been slight, and the forces of the patient little broken, and especially if it has been thought unnecessary to purge

in the disease, and no diarrhœa has supervened,* blood-letting should not be omitted; the patient should be freely purged with calomel, followed by senna, with crystals of tartar, and this repeated every alternate day; and (for it is difficult with a child to get much medicine taken) a beverage of half an ounce of sp. ætheris nitrici in half a pint or a pint of water, with a small proportion of syrup, taken in the day.

Sometimes instead of the senna a tea-spoonful of an electuary composed of jalap two drachms, supert. potassæ half an ounce, honey half an ounce, may be given in the morning succeeding the administration of the calomel with the best effect.

But assuming that the little patient is weakly, that the forces are much broken by previous delicate health, and a severe attack of illness, it will be necessary to have recourse to diuretics—either the combination of digitalis with a bitter, or some of the bitter diuretic infusions. The infusion of digitalis and the infusion of gentian

* It is well known that Sydenham recommends V. S. in the diarrhœa after measles: the secretion from the vessels of the skin, in scarlatina, where this natural evacuation has not occurred, seems still more to require this remedy.

"Quem et diarrhœa," says Sydenham, "quam morbillis excipere diximus, vænesectione pariter sanatur."

have been recommended; and I have seen, added to this, the best effect from a drachm of the liquor potassæ in every six ounces, composed of equal parts of infus. digit. and infus. gentianæ. In a few cases the decoction of the pyrola umbellata, to every pint of which half a drachm of the tinct. of lyttæ has been added, (two ounces taken every four hours), has succeeded in relieving the disease, in a manner very striking to the bystanders.

In no case, in my experience or observation, has success followed on the use of tonics alone. It is probable that in many of these cases the use of the vapour bath would be a valuable adjunct in promoting the cure, by inducing a more healthy action of the skin; but it should by no means be employed without premising the use of the lancet.

3. In chlorotic anasarca, or anasarca occurring after great loss of blood, a functional condition of the heart occurs not very dissimilar to what happens when the viscus is itself diseased in its structure. An enlarged and dilated heart does not circulate its blood to the extremities; congestion of the venous system takes place; a secretion from the minute arteries relieves this condition. Now in chlorosis there is a deficiency of red blood; the heart makes up in frequency, in

very severe cases, what it wants in force, (the same occurs after great loss of blood—hence what is called the hæmorrhagic pulse,) and the blood again shews a disposition to stagnate in the right side of the heart; the ankles and legs swell, the face is puffy and white; in slight cases the pulse is languid; in severe ones, as we have said, rapid and very weak; there is terrible palpitation on ascending a stair; the pulsation is communicated to the jugular veins, and there is much headache: but the treatment is widely different from that necessary in a case of organic disease; the patient's strength in this instance must be built up, the injured organ is not be relieved from its oppression by evacuants, but stimulated gradually to circulate the blood more regularly, while nutrition affords this fluid of its natural and stimulating quality.

That physician is the best in this instance who can introduce steel into the system without exciting fever; in severe cases, however, the patient will bear only the very mildest preparations.

The ammoniated tincture, given in the dose of half a drachm to one drachm several times in the day, will be generally borne; when, however, it produces much headache, the cure should be commenced by ammonia, æther, or the fœtid

gums;* after a short time steel will be borne, and in another week, the most effectual, in my experience, of all the preparations of steel, the mist. ferri comp. will be taken in the dose of an ounce, gradually increased to two ounces, twice in the day, with the most decided benefit. To this must be added, if possible, horseback exercise, and pure dry air; first the lightest, and then the most nutritious animal food should be administered†: in this way all the symptoms will gradually disappear; the œdema first, and then the difficulty of breathing; the palpitation, so long felt and so alarming, will occur but seldom, and finally not at all. The catamenia will be regular, the pain in the left hypochondrium (sometimes in both hypochondria) will be no longer troublesome, and complete recovery established.

Yet such a course as this, where the anasarca arises from an enlarged and dilated heart, would undoubtedly destroy the patient: fortunately,

* ℞ Sp. Ammon. Succin. ♏xvj.
Mist. Camphoræ, ℥iss. M.
Ft. haustus bis terve in die sumend.

℞. Sp. Ammon. fœtid. ♏xvj.
Mist. Camphoræ, ℥iss. M.
Ft. haustus.

† The bowels should be kept open with the aloes and myrrh pill, or equal parts of ext. colocynth c. and pil. galbani comp.

generally speaking, the diseases are not frequent at the same age, chlorotic anasarca being exclusively a disease of youth, and anasarca after great evacuations, following on a well-known and ascertained cause; while anasarca from passive diseases of the structure of the heart is usually an occurrence at a later period of life, and its exciting causes, as fright—intemperance, anxiety, or excessive fatigue—are also pretty generally apparent.

CHAPTER V.

ANASARCA FROM DISEASE OF THE KIDNEYS.

THAT the kidneys are frequently diseased, as a cause of dropsy, is a modern discovery, which we owe to the patient investigation and sagacity of Dr. Richard Bright; and subsequent authorities have confirmed the fact, that the disease of these organs is always accompanied by a greater or less degree of coagulability of the urine, according as a greater or less degree of alteration of the structure of the kidneys exists—from perfect granulation, as pointed out by Dr. Bright, to simple engorgement.

The specific gravity of the urine is also always less than in healthy urine, and there is often a deficiency of urea in it.

The observations of Dr. Bright have been corroborated in an excellent paper by Dr. Christison, and afterwards by Dr. Gregory, in the Edinburgh Medical and Surgical Journal; while

the method of treatment has been more especially pointed out by Dr. Osborne, of Dublin, in his recent very able work on Dropsies, principally in illustration of this form of disease.

Dr. Christison has left little to wish for in his very complete paper on the symptoms and pathology of this disease; and states (a fact repeated by Dr. Gregory) that, in every fatal case in which coagulability of the urine, with a low specific gravity, existed before death, the disease pointed out by Dr. Bright was found to exist, on the post-mortem examination; thus fully and powerfully corroborating the statement of the latter physician. Dr. Osborne repeats the same result from his experience; and in the wards of St. George's Hospital I have watched this test during many years; invariably finding, where cases with coagulable urine and low specific gravity proved fatal, that the kidneys presented a fac-simile of the representation given of them in this disease by Dr. Bright, in his Hospital Reports.

The urine* in this disease is sometimes scanty

* "Of this state (dropsy) deficiency of urine is a usual but not a constant effect: for I have seen at least ten cases, at various ages, from fifteen to sixty, of dropsy, chiefly anasarca, ending in hydrothorax, in which the quantity of urine has spontaneously been, from the beginning till two or three days before death, fully equal to that which was natural: as for example

and high coloured ; but in the worst cases the urine has been found to be pale and abundant, while the anasarca was general and to a great extent. In such cases the disease is very fatal ; and the condition of the kidney, its extensive disorganization and obstruction visible after death, explains the reason why anasarca, without any diminution of the secretion of the urine, was always looked upon as a condition of disease unusually hopeless.

The cases which have occurred in my practice, where the urine was abundant and pale coloured, have all been in young subjects, from eighteen to twenty-five years of age : three of these cases occurred to me in the course of last year : in all of them the kidneys had reached the highest state of granulation.

The coagulability of the urine after scarlatina, with admixture of blood, was noticed by Dr. Wells ; and this peculiarity in the secretion formed a division in Dr. Blackall's work on Dropsies. That it occurs in dropsies from cold, in which an inflammatory state of the system exists, has been remarked, and is relieved by

from two to four pints daily, clear and *even sometimes pale*, and yet the patients have all died. Nay, I have never seen a patient recover under these circumstances of a natural state of urine."—*Parry's Posthumous Works*, vol. i. p. 192.

ordinary antiphlogistic treatment; but it exists also in cases where long-continued organic disease has broken the vital powers, and where, though inflammation may have been the cause of the destruction of the structures in the first instance, no inflammatory action any longer exists, and has been shewn, in every fatal instance, to have proceeded from disorganization of the kidney, and of the kidney alone.

There is only one position on which I am inclined to differ with the accomplished author of the Hospital Reports. Where disease of the liver, heart, and kidneys, exist in the same patients, Dr. Bright appears to believe that disease of the kidneys is the primary disease, and the disorganization of the other important structures secondary. It is more clear to me, that the same cause, the abuse of ardent spirits, or long-continued and repeated exposure to cold, which has produced disease in one viscus, has also affected the others. We know that disease of the liver and of the heart proceed from intemperance; and instances are not wanting of disease of the kidney producing anasarca arising from this cause, and existing alone. One of the worst cases I ever saw, of anasarca with coagulable urine, was in a youth of nineteen, who had been addicted to the immoderate use of spirits, rum principally, and no other viscus was diseased except the kidneys.

Again, how often do we not find, after hard drinking, enlargement of the heart and liver, accompanied by anasarca and ascites, while the kidneys remain perfectly sound?

About half the cases of dropsy admitted into St. George's Hospital, in my experience, have coagulable urine: and in about one-third of such of these cases as have proved fatal, the kidney was the only viscus diseased: the other two-thirds had disease of the heart and liver in addition to granulation of the kidneys. Of those cases of anasarca without coagulable urine which proved fatal, the heart was invariably greatly enlarged; and these were often complicated with ascites from disease of the liver.

When a patient presents himself for examination with anasarca of the legs, thighs, and parietes of the abdomen, of some weeks' duration, where no disturbance in the motion or regularity of the heart's action is to be perceived, and on testing the urine by heat, or the addition of a mineral acid, it coagulates strongly, we may safely conclude that disease of the kidneys is the organic cause of the dropsy: if the urine be scanty and high coloured, it is a relievable case; if abundant and pale-coloured, one of deep anxiety. The skin is singularly pale and dry in this disease: and Dr. Bright has very fully ex-

emplified the fact, that persons labouring under it are subject to sudden inflammatory attacks of various viscera, and even of effusion into the ventricles of the brain. The principal indications of cure, then, are to get rid of the dropsy by such remedies as will alter the morbid condition of the urine; and, secondly, to remove any inflammatory attack which may arise in the course of treatment. Dr. Bright, and subsequently Dr. Osborne *, have laid great stress on the sympathy which exists between the skin and the kidneys, and recommend every attention to restore the healthy secretion of this organ. The great relation which exists between these two secretions has long been observed, and indeed is obvious to the most careless observer in the ordinary functions of health: in disease, the same importance of the relation is still more obvious, nor can I instance it better than in the words of the celebrated Dr. Mead:—

"There is a great harmony between the kidneys and glands of the skin, so that the humours brought on the latter easily find a way

* On this point it would be quite unfair to quote single passages from Dr. Osborne. This physician tell us, and his evidence is quite worthy of confidence, that one-fourth of the cases, such as we have described, succeeded under his plan, "which never failed in removing this kind of general dropsy, *whenever the surface of the body was restored to a perspiring state.*"—See *Osborne on Dropsies*, p. 45.

The whole work is well worthy an attentive perusal.

through the former, and are carried off by urine; and on the other hand, when the kidneys have failed in the performance of their functions, an urinous humour perspires through the cuticular pores*."

Dr. Wells cured three cases out of five, of anasarca with coagulable urine, with cantharides; and Dr. Mead recommends them in lepra, from their diuretic property. Dr. Bright states that he has succeeded with the cream of tartar in several instances, and I have found this medicine far more useful than any other in dropsy from disease of the kidney; but looking to the functions of the skin, I have employed also the vapour bath, using this remedy on alternate days. The perspiration excited by the vapour bath is excessive, and its use should be graduated to the patient's strength. I have found this remedy far superior to any internal one known to produce diaphoresis. Where there is pain in the lumbar region, as not unfrequently occurs in an aggravated form of the disease, cupping is very useful, and every intercurrent inflammatory disease I have been in the habit of treating exactly as if no dropsy had existed, according to the symptoms and locality—blisters only being excepted, from their being often followed by erysipelas, and even sloughing.

* Mead: Medica Sacra.

I have been careful, on a subject so extensive as the present, not to overload the observations I wish to lay before the profession with cases; my opinion is formed from the habitual observation of them; but, except to illustrate a particular point, I have been desirous of leaving results to be considered alone.

The following case of dropsy from disease of the kidney will best illustrate the mode of practice which I have found successful:—

B. C., æt. 30, was admitted into St. George's Hospital under my care, March 30th in this year: she laboured under anasarca of six months' duration, affecting the lower extremities, integuments of the abdomen, and face. The heart and respiratory organs were natural in their action: pulse 84, and not weak; the bowels confined.

The bowels were opened by a dose of calomel, followed by senna and crystals of tartar, and she was ordered to be bled.

The blood drawn shewed no inflammatory crust: the urine was of very low specific gravity, and coagulated into a solid mass by acids and heat; it was very scanty and high coloured.

31st. She was ordered the vapour bath every alternate day ; was cupped on the loins ; and the diuretic mixture of infus. digitalis, liq. oxym. hydr., and tinct. canth. ordered, but it disagreed, making her feel sick : an ounce of supertartrate potass was ordered to be taken daily in solution.

On the 6th, much perspiration was found to be produced by the bath. On the 12th, anasarca was greatly diminished, urine increased in quantity, and general health greatly improved. 19th, The urine coagulated very slightly, either by acids or heat. 23d and 24th, Much pain was complained of in the head and left side, with spasmodic twitchings of the muscles ; the pulse was strong, and the skin warm : she was ordered to be bled, and calomel grs. ij.. and opium gr. ½, given every third hour. The blood drawn was buffed and cupped.

On the 28th, all these symptoms having disappeared, the mercury was omitted, and the use of the cream of tartar resumed, with the bath.

30th. She was without pain ; the urine was pale, abundant, and alkaline : pulse 80, and not strong ; the bath very agreeable to her.

She appeared quite well, when, on the 13th of

May, another inflammatory attack, apparently affecting the kidneys and bladder, took place: she was bled, (the blood was inflamed,) and calomel and opium prescribed for two days: when the symptoms having disappeared, she resumed the use of the bath and cream of tartar.

On the 26th the dropsy had entirely disappeared, the urine was natural in quantity and quality: she remained in the house until the 7th of June, during which time her appetite and the secretion of urine were perfectly natural, and she had regained her strength.

PART II.

ASCITES, OR DROPSY OF THE ABDOMEN.

ASCITES, or dropsy of the peritoneal cavity, may arise, in an inferior degree, in either of the above-mentioned conditions of disease, in conjunction with anasarca from disease of the heart or disease of the kidneys. I believe, however, that where the kidneys alone are diseased as a cause of dropsy, ascites is not generally perceived, (such has been my experience); but any apparently increased bulk of the abdomen arises from anasarca (infiltration of fluid) of the cellular membrane of the integuments.

Where the heart is alone diseased, the collection of fluid occasionally occurs in the peritoneal cavity, but it is subordinate, from its smaller quantity, in importance to that contained in the cellular membrane. The circulation in the abdomen is peculiar: the greater quantity is expended in forming the important secretion of bile from the vena portæ, and the remainder only is returned by the hepatic veins to the right side of the

heart. The obstruction therefore to the heart's action, arising from enlargement or disproportionate dilatation of the cavities of the organ, will affect the venous system in the abdomen far less than throughout the whole body: hence it is that anasarca is the most common form of dropsy attendant on disease of the heart, and where this important viscus is alone diseased, ascites scarcely appears.

The principal cause of ascites, or dropsy of the abdomen, is disease of the liver; and much speculation, especially of late years, has been employed, to demonstrate that the disease of the liver, which precedes ascites, is always inflammation, and that it principally affects the serous coat.

Formerly, enlargement of the liver was considered as the cause of ascites, and the mechanical bulk of the viscus pressing on the vena portæ as the cause of obstruction to the due circulation of the secreting fluid; hence thrown back on the capillary veins, and causing a corresponding exhalation of fluid from the exhalent arteries, to relieve the congested vessels, and maintain the balance of the circulation.

Such a condition, however, does not occur,

except very rarely, as a cause of dropsy of the abdomen, and then only when the viscus is not simply enlarged, but indurated. Where the liver is enlarged by depositions of matter of a malignant nature, and known under the name of encephaloid tubercles, its size will often occupy the whole abdomen, without any ascites being present. It has occurred to me to see a case, in which the liver measured sixteen inches in length and fourteen in breadth, occupying the whole of the superficies of the abdominal cavity, excepting a small notch or space in the left iliac region, without any effusion of fluid whatsoever; there being, as it appeared, a sufficient interstitial quantity of the usual structure of the liver to permit the circulation necessary for its functions to be carried on. The most frequent appearance of disease of the liver, and that which is most generally connected with ascites, is characterized by diminution of the bulk of the viscus: the liver is about one-half its natural size, very hard, and with the sharp edge, so characteristic of it in a state of health, blunt and rounded. In post-mortem examinations, instead of finding it protruding into the belly, we seek for it under the ribs in the right hypochondrium, and find it there drawn up, as it would seem, from its diminished size. The peritoneal coat is in such case most frequently found thickened: this not un-

usually takes place in parts; and this partial thickening gives to the viscus the appearance of being puckered, not very unlike the lobulated structure of the calf's kidney. On cutting into these portions, the viscus itself does not present corresponding depressions, but the appearance arises from the membrane having been thickened in parts. Occasionally the whole peritoneal coat is thickened, of a milky white colour, and the viscus beneath contracted, extremely hard to the knife, and presenting a round almost globular mass when removed from the body.

The consequence of this change is, *the uniform pressure upon and obstruction of the minute and secreting branches of the vena portæ:* such an obstruction naturally throws back the blood upon the trunk of the vein; the capillary veins are congested, and the capillary arteries secrete fluid — not a transudation from their coats, as was conceived, but a secretion resembling the serum of the blood.

This thickening of the peritoneal coat has made some authors suppose that inflammation of this covering alone is sufficient to produce the disease, and that it is never found where such marks of inflammatory action are absent: hence that dropsy is necessarily the result of inflammation, and the deduction to be drawn is, that it

is to be combated essentially by antiphlogistic remedies.

But this is a mistake: inflammation of the peritoneal covering of the liver, in common with other parts of the peritoneum, may exist to a great extent without dropsical effusion: and there is another condition of disease of the liver in which the peritoneal coat remains uninjured, where dropsy is equally the consequence, because *uniform obstruction* is presented to the extreme branches of the vena portæ.

In this instance, the secreting structure of the liver is nearly obstructed by the deposition of reddish-white substance, by some believed to be lymph, and the effect of inflammation, by others supposed to be cholesterine; but in either case, on a section of the liver, the whole seems to be made up of rounded masses, which, in some instances, can be separated from the cellular membrane which connects them, but the change is uniform throughout the whole mass. In many such cases the peritoneal coat is quite clear and transparent, proving that causes exist, independent of its thickening, to produce such an obstruction to the progress of the blood, as to act as the proximate cause of dropsy.

But it will be asked, how does this explanation

agree with the cases in which the structure of the liver is wholly obliterated—in which the well-known secreting parenchyma is changed into a fatty mass, or of a very pale yellow colour, or almost entirely composed of encephaloid tubercles, *and yet there is no dropsy present?*

That such cases have occurred there can be no doubt; and it appears to me to be accounted for by the alteration in the circulating fluid itself: there is a degeneration of the whole body, the arteries do not secrete fluid, in order to keep up the balance of the circulation, impeded by the disease of the viscus; but both solids and fluids undergo a degree of degeneration, and the whole system tends to decay. The appearance of persons labouring under this form of disease confirms this idea; the countenance is of a waxy yellow colour; no red blood appears circulating on the surface; the principal ailment complained of is excessive weakness, sinking, often without any local pain; the pulse is weak, and about a hundred in a minute; the patient is emaciated, and the muscles have lost their firmness and colour; in blood drawn from the arm, the red particles are scanty, and the fibrin scarcely adheres; a weakened state of the nutritive fluid, adapted to the weakened state of parts which act in the function of secretion, and both tending to the undoubted death of the patient.

I shall proceed, then, to speak of the most frequent, most obvious, and most invincible form of ascites, which arises, as has been before stated, from a contracted state of the liver, with a thickened peritoneal coat, or from a universal alteration of the secreting structure of the viscus, by the deposition of reddish-white matter; by some considered to be coagulable lymph, by others believed to be cholesterine, the *peritoneal coat retaining in this case its transparent and healthy character.* The first condition is undoubtedly produced by intemperance, especially in the use of spirits. The second case is less frequent, and I am inclined to believe often arises from (at least in three instances it could be traced to) indulgence in the use of opium.

The external appearance of a person labouring under ascites from either of these causes is in striking contrast with those cases of anasarca which arise from disease of the heart. When some induration of the liver accompanies disease of the heart, both ascites and anasarca are present, but the abdominal effusion is small in quantity, compared with that which takes place in the cases I am attempting to describe: in the former, the increase of bulk is principally owing to infiltration of the cellular membrane connecting the muscles of the abdomen; in the second, these muscles are wasted, the fat absorbed, the distended ab-

domen is tense in every part, the swollen veins give to the whole a bluish appearance, while the hands and arms are wasted, the features drawn in and haggard, presenting the appearance of what has been termed "facies hippocratica;" the legs are also often wasted, and indeed always, early in the disease, but at length the pressure of the immense body of fluid in the pelvis prevents the return of blood in the iliac veins, and the lower extremities become anasarcous. The pulse is quick and feeble; the tongue red, and rough with prominent papillæ, and sometimes aphthous; the urine is very scanty, and deposits a pink sediment, like the finest rouge; the thirst is insupportable; and the alvine excretions scanty and ill-coloured, the bowels being sometimes difficult to move, at others affected with diarrhœa.

To such a condition of disease it would be impossible to propose a cure, unless our art enabled us to repair the greatest extent of visceral disorganization. When the effusion is recent, indeed, advantage is occasionally derived from rubbing in mercury over the whole abdomen; a drachm of the liniment hydrarg. may be used for this purpose, rubbed in morning and evening; three grains of calomel, with double the quantity of rhubarb, being given every alternate night, and followed by a senna draught, with crystals of tartar, in the morning.

It is to this condition of disease, that on the continent, and indeed in our own country, the infusion, and decoction, and extract of the dandelion, have been thought peculiarly well adapted as a deobstruent.

It has, especially in Germany, been considered of great efficacy; and was prescribed by Zimmerman for the dropsy, which terminated the life of the great Frederick of Prussia. Had the philosopher persuaded the monarch to abstain from eating enormous quantities of most indigestible food, he might, perhaps, have succeeded in retarding the disease, and the virtues of the taraxacum have been still higher extolled. I have seen this medicine prescribed in hospitals, in very large doses, in extract; I have seen it, both abroad and at home, given in decoction and infusion, without ever being able to trace any obvious effect from its use beyond slight diuresis, or occasionally, when in large quantities, relaxation of the bowels.

The patients labouring under this form of disease are scarcely able to bear the elaterium: the injury to the principal organ of nutrition, and the weakened frame, sustain ill the violent effects of this medicine, and the patient's chief comfort is derived from the use of diuretic drinks, especially nitre in solution, which relieves the

craving thirst more than any other remedy. The action of other diuretic remedies will be found described in the former part of the work: it is unnecessary to repeat the observations here.

Where the disease is very far advanced, I have occasionally (in one or two instances) seen tonics do more on the intermediate days, when the purgative formerly mentioned is not given, than any of the ordinary hydropic remedies. Two grains of the sulphate of quinine dissolved in two ounces of water, with a few drops of diluted sulphuric acid, and rendered more palatable to the stomach by the addition of a drachm of the tinct. cardamomi c., have appeared for a few weeks to work wonders, and to impart at least to the patient that hope without which his state would be even less supportable than it was. In such cases, also, some relief is obtained by sustaining the patient's strength; thus enabling him, as it were, to support life under extensive disease of structure which no known remedies will relieve. The preparations of iron are consequently occasionally used with success. The muriate of iron acts also in such cases sometimes as a powerful diuretic. Ten minims of the tincture may be given thrice daily in infusion of quassiæ.

When the collection of fluid has existed during

some weeks, the mind of the practitioner is directed to the immediate relief of the distention, by tapping. There is some little difference of opinion in the profession, as to the best time for performing the operation; some postponing it until a fair trial has been given to the operation of medicine, others thinking that the cure will be expedited by performing the operation as soon as the fluid has become very abundant. The arguments brought forward for this method of proceeding are,—1st, that by drawing off the fluid the organic disease may be ascertained. 2dly, that it is well known that diuretic medicines producing little effect while the distension is excessive, become extremely efficient as soon as the fluid is evacuated: of this fact there is no doubt. It has occurred to me to see patients, the night succeeding the operation, void several pints of urine under the use of the same remedies which had failed in producing as many ounces previous to it *.

Still in such cases I am not inclined to advise it until purging, with neutral salts, and mercurial

* P. Frank, though recognizing the fact, still objects to early tapping.

" Mais les cas rares ne doivent pas servir de base aux indications. Si la paracentèse augmente fréquemment la sécrétion des urines, souvent elle n'exerce sur elle aucune influence sensible."

frictions, have been tried. It is not unaccompanied with danger from peritoneal inflammation; and, as is well known, the necessity for having recourse to it speedily recurs.

Where the liver has been contracted during a long period, has a puckered peritoneal coat, or that membrane is thickened like semi-transparent horn, its sharp edge having entirely disappeared, or where the secreting vessels are uniformly obstructed, the fluid drawn off is quite limpid, and enormous in quantity.

If clear serum, but deeply tinged with blood, follow the introduction of the trochar, we may be certain that a malignant growth of considerable size, (so large as to press upon the blood-vessels) often attached to the liver or ovarium, is the cause of the peritoneal dropsy. I am not to be understood to say, that when a large morbid growth in the abdomen, of the kind termed fungoid or malignant, proves fatal, accompanied by dropsy, that the serum is always bloody; but that this bloody serum, when it does occur, always depends on such morbid growth. In many cases in the hospital I have seen this remark verified, so that I believe it to be strictly correct.

There are two other principal appearances of the fluid drawn off in abdominal dropsy by the

operation of tapping : it is often of a pale yellow colour, more or less tinged with bile, and on standing quickly coagulates.

The last appearance is from cases in which the collection of fluid is not large, and principally from patients of an early age and strumous habit of body. It is the colour and consistence of whey, with shreds of lymph floating in it; and is undoubtedly the product of inflammatory action, modified by the constitutional disease we have mentioned, for where acute inflammation of the peritoneum terminates in similar effusion, it uniformly proves fatal : it is the product, therefore, of a slower inflammatory action than in acute cases.

Those who advocate inflammation as the cause of dropsy in every case, consider that these conditions of the fluid are produced by different degrees only of that morbid process, varying from acute through various subacute stages of inflammation.

In the last kind of effusion which we were considering, inflammation undoubtedly appears to have been present. In the other cases, inflammation may have been and probably has been the cause of the thickening, and hardening, and contraction of the liver, but the effusion is a conse-

quence of this alteration of structure already produced: and in cases of serum effused from the pressure of malignant tumours, these peculiar formations are, I believe, traced by no one to true inflammatory action at their commencement or during any part of their growth.

In speaking of anasarca I remarked that, in very severe cases, the sudden subsidence of the effusion was an occurrence of very dangerous import. The same applies to the sudden disappearance of ascites after the affection of the liver of which we are speaking, but the phenomena are different: the disappearance of the fluid is preceded by frequent and almost uncontrollable vomiting; or if the water has been drawn off by tapping, and does not again collect, violent pains in the bowels occur, accompanied by diarrhœa, which is at last often not to be restrained by any of the usual remedies. Where such cases have occurred, I have anxiously looked, after death, for some cause to explain these remarkable symptoms. A very unusual appearance has presented itself: the intestines are of a deep leaden blue colour throughout their whole extent, and the omentum of the same colour; the peritoneal coat covering the intestines thickened and opaque. Sometimes shreds of lymph, of no very recent formation, adhere to the convolutions, but in general the whole peritoneal covering of the

intestines is only thickened equally throughout, and of this blue colour. I have known the pain and diarrhœa immediately succeed the disappearance of the fluid, and last during several weeks, its severity little mitigated by remedies, and I have been in the habit of pointing out its unusually fatal import to the pupils. In every case in which such symptoms have preceded the termination of the patient's life, the ascites has been occasioned by the peculiar, hardened, and contracted state of the liver, which I have attempted to describe.

In speaking of the several forms of ascites which arise from a contracted and hardened liver, I am not to be understood to overlook that effusion of fluid into the abdominal cavity which succeeds to enlarged and hardened liver and spleen. So long as the liver is soft in its texture, and a sufficient quantity of healthy parenchyma is left for the peculiar circulation in this viscus, it may be enlarged so as to occupy the whole abdomen, without being the cause of ascites: but if the enlargement be accompanied by hardness, effusion (less indeed in degree than the former case, and more tractable by medical art) will take place.

This is especially the case in ascites which arises after enlargement of the liver and spleen,

from repeated attacks of ague. During the cold stage of an intermittent, the blood recedes from the surface of the body into the viscera, a hot or inflammatory stage succeeds, and the repetition of these paroxysms is followed by enlargement of the viscera before mentioned; and after repeated attacks, by ascites, or in its place, frequent and sometimes fatal epistaxis, or vomiting of blood. In such cases the well-known cause, and indeed the enlargement of the viscera, which may be felt through the integuments of the abdomen, render the case clear.

From the time of Sydenham*, purging at the conclusion of ague has been insisted on; and by thus drawing off from the enlarged and distended vessels, the increased size of the organ is prevented. Where such means are not adopted, or the unhappy patients are obliged to be exposed to the noxious exhalations which occasion repeated attacks of the disease—as in the Maremma and the Pontine marshes in Italy—the thin and haggard countenances, the swelled, protuberant belly, and

* "Sublato morbo æger sedulo purgandus est; incredibile enim dictu, quanta morborum vis ex purgationis defectu post febres autumnales subnascatur. Miror autem hoc a medicis minus caveri, minus etiam admoneri."—*Sydenhami Opera*, art. *Febr. Interm.*

absence of nutrition, point out this disease in characters not to be mistaken.

Fortunately, except under very aggravated circumstances, the effusion and its cause are removed, and the patient permanently cured, unless constantly exposed to the miasmata. Mercurial frictions have often a most extraordinary effect in this disease, reducing the swellings, and from their diuretic power carrying off the effused fluid at the same time. To these saline purgatives should be added; and it is remarkable that mineral waters possessing purgative qualities are often found in the neighbourhood of marshy districts, affording the ready means of relieving the diseases engendered by a sojourn in these unhealthy regions. The waters of St. Filippo, in Tuscany, are annually resorted to for this purpose: they resemble in some measure the waters of Harrowgate, often drunk in our country, to relieve the chronic diseases of the liver, contracted during a residence in India. The waters also of Monte Catini, near Pisa, are celebrated also in that country, whose marshy districts abound with ague, for the cure of visceral obstructions.

The practice also of letting fall a column of hot water on the affected part, under the name

of *douche*, affords a very effectual method of reducing the swellings of the viscera. This practice in France and Italy, in such cases, is almost universal.

Modern discoveries also have afforded a most powerful agent in reducing these swellings, when of long standing, in the hydriodate of potass. Two or three grains of this salt, taken, dissolved in two or three ounces of water, twice daily, will sometimes succeed when other remedies fail: under its use the patient's strength and appetite will return, while the dropsical effusion subsides gradually, with an increased and limpid flow of urine. Of course, if the enlarged viscera be painful to the touch, it will be advisable to apply leeches repeatedly, before having recourse either to mercurial friction or the use of the hydriodate of potass. Where mineral waters cannot be obtained, the best saline medicines are the tartrate or supertartrate of potass, or the Rochelle salt (tart. pot. et sodæ), in the dose of from half an ounce to six drachms, every morning, dissolved in half a pint of water.

The use of bark in the cure of ague suggested to many authors the continuance of its employment in the visceral obstructions consequent on frequent attacks of that disease; but physicians who entertained such opinions were almost uni-

formly obliged to mix with this medicine some evacuant, generally a diuretic. It will appear by the following opinion of Frank, that bark is ineffectual, even in the hands of the advocates for debility, without such an addition :—

"Thus, even in the dropsy which succeeds to intermittent fever, when the patient derives no advantage from the bark, or cannot bear it, we add gentle diuretics to this medicine, and gradually increase them by the addition of the more powerful ones: we first combine cream of tartar and juice of elder-berries, afterwards with oxymel scillæ in form of electuary. This combination produces often the effect which cannot be expected from bark alone. In this state of sensibility, *bark is often less efficacious* than bitters, such as the lesser centaury, the trifolium fibrinum, absinthium, quassia, together with the root of the ononis spinosa, whose diuretic properties we have often experienced, or with the berries of juniper*."

* Frank, Médecine Pratique, Retentions Aqueuses, p. 240.

CHAPTER VI.

ASCITES FROM DISEASE OF THE PERITONEUM.

TUBERCULATED accretion of the peritoneum has been so ably described by Dr. Baron, of Cheltenham, that I should not here speak of it, except on account of the ascites, with which it is often accompanied. The disease, where it proves fatal early, consists of a pearly thickening of the peritoneum, the membrane being pushed up by numerous eminences, or tubercles deposited on the cellular side of the serous membrane: in more chronic cases, large masses of thick cheesy-looking matter are deposited on the cellular side of the omentum, sometimes distending it, like a bag, into an unequal globular tumour; at others, into a thick flat mass, compressing the intestines like a pad. In this form of disease there is often vomiting, and vomiting of a peculiar character; it is of a deep leek-green colour; precisely the colour of the beautiful fluor spar, found at Alston

in Cumberland; sometimes varying to purple. I am not to be supposed to say that this peculiar vomiting occurs in every form of this disease; but where it does occur, in every instance the disease so faithfully described by Dr. Baron has presented itself on the examination of the body.

My attention was first called, about thirteen years ago, to this circumstance, in a very remarkable case, at Guy's Hospital, under the care of Dr. Cholmeley. That accomplished pathologist stated at the time, that whenever he had seen this peculiar vomiting, the post-mortem appearances were those of the disease alluded to, and thus it proved; and in consequence of this verification I have been enabled, in several instances where the symptoms were obscure, to determine, from the presence of this peculiar vomiting, the nature of the disease; and I do not remember a single instance in which the event did not confirm the diagnosis. At the same time, I do not remember to have seen this symptom present when the disease was accompanied with ascites, the evacuation preventing, probably, the serous effusion.

The dropsy which accompanies this disease is always more scanty than that which is the consequence of disease of the liver; sometimes only a few pints, and seldom more than two gallons,

are poured out: indeed, the latter quantity is, as far as my experience goes, the utmost limit of effusion in such cases.

It is more common in young people than in old, and in females than in males.

The dropsical effusion is often mixed with shreds of lymph, and is more or less whey-coloured, from the presence, doubtless, of low inflammatory action, and it more frequently accompanies the universal thickening of the peritoneal covering of the bowels, than where accretion of the omentum forms the mass of disease: after death the small intestines are glued together, and more than once I have seen the whole taken out together after death, in one globular mass, by passing a ligature round the root of the mesentery.

The pulse in such cases is weak and quick; the features pinched and sharp, and the tongue red and glazed, as if a hot iron had touched it; sometimes of still deeper red colour, with patches of aphthæ. There is always a sense of weight and distension in the abdomen, even where no ascites is present.

Mercury administered internally is rarely attended, in my opinion, with advantage; nor does powerful purgative medicine seem to produce

any really good effect, and it is apt to induce vomiting, which is much to be dreaded. The disease occurs in strumous constitutions, and appears to arise from inflammation, modified by that constitutional disease, as intractable as chronic strumous ophthalmia, or chronic scrofulous disease of the joints, or the slow inflammation and suppuration of lymphatic glands, are, by antiphlogistic remedies.

I have observed that where effusion takes place, it often arises early in the disease; whereas, where the disease is fully established, and the prolongations of the serous membranes are formed into hard masses, it is more frequently absent, while peculiar and fatal vomiting relieves the obstructed circulation; and hence it is, I think, that I have seen several young patients rally, where the dropsy appeared early from this organic affection.

The disease is not so very common as to enable any one to lay down a general rule, or to speak positively on the subject: here I only relate the result of my own experience. Tapping has uniformly been followed by bad results, increasing the low inflammatory action, and tending thus, perhaps, to exasperate the disease; at least, I have never seen a case recover after this operation has been had recourse to; and as the collections

of fluid are rarely very great, the urgent desire of the patient to be relieved from the distension is not so strong as in effusion into the peritoneal cavity from other causes.

If, when the physician is consulted, the pain on pressing the abdomen be severe, one bleeding from the arm will be necessary, or if the patient be weakly, a dozen leeches may be applied to the abdomen: further than this, antiphlogistic practice appears to be hurtful, and in many cases the practitioner is not consulted until the results of slow inflammation have been established; thus rendering depletion improper, as weakening the forces of the patient, without controlling the action which first produced the disease.

Frictions with the liniment hydrarg., morning and evening, are often attended with benefit, but it is on the use of the hydriodate of potass that I have been accustomed to rely, from finding the general health recover under its influence, and the effusion, hardness, and tightness of the abdomen, disappear in a remarkable manner. Two grains of this salt, given in a draught of equal parts of cinnamon water and common water, with a little syrup, may be administered for several weeks, twice in the day, with no other visible effect than the amendment of the patient's health, or if any visible effect is produced, it is slight diuresis:

even during its employment, a few leeches may occasionally be applied with advantage where there is any pain on pressure : if restlessness and sleeplessness be present, five grains of the ext. conii may be given with each draught, in the form of pill.

The bowels in this disease are generally constipated, but the secretions, when obtained, are often not unhealthy : it is difficult to move them with colocynth or similar medicines, from the pain they occasion, or with mercurials, from the vomiting which often accompanies, and the debility which succeeds to their use. In such circumstances the medicine which I have found best to agree, is the phosphat. sodæ, of which half an ounce or six drachms may be given daily in a pint of beef tea. It is not disagreeable, and can sometimes be borne by stomachs which, from organic disease, reject every thing presented to them. Whether really these neutral salts possess a deobstruent power, (as the sulph. of potass was supposed to have in tabes mesenterica), or the good effect is owing to the regular and long-continued evacuation of the bowels, I cannot assert, but I can safely recommend them as a most convenient laxative in the disease I am commenting upon.

A few months since I attended, with Mr.

Merriman, jun. of Kensington, a young lady, æt. 13, affected with ascites apparently arising from this disease. Under the plan laid down, persevered in for several weeks, not only the effusion disappeared, but the tumours also became imperceptible on minute examination.

Ascites is also sometimes the consequence of other diseases. Very solid tumours of the ovary, or enlargement of the ovary, with much of the structure in the cysts solid, will often, from pushing upwards the intestines, compress veins of the venæ portæ, and produce ascites. It is not unfrequent to see the introduction of the trochar followed first by clear serum from the peritoneal sac, and afterwards by ropy muco-albuminous fluid from a cyst in the ovarian tumour. In a case in which Mr. Cæsar Hawkins operated, eleven pints were drawn off from the peritoneum, and nine from the cyst. In such cases, the recumbent posture and diuretic remedies will often relieve the ascites in a remarkable degree, and after a time the tumour often shifts its place, and the local pressure is removed.

Some persons, even the great Morgagni himself, have attributed dropsy, in some cases, to bursting of the lymphatics, and ascites to bursting of the thoracic duct. I have carefully examined the thoracic duct, in many cases of ascites, but never

could detect any alteration except distension in it and the lymphatics. Neither does simple obstruction of glands appear to occasion dropsy, by pressure on the lymphatic vessels: large collections of diseased glands are found in the axilla, pelvis, and in the neck, but without dropsy. The enlargement of the mesenteric glands is more frequently accompanied by marasmus than by dropsy: and even when ascites is present in combination with this disease, there is also the slow scrofulous inflammation of the peritoneum which we have just been describing, or the glands are so much enlarged as to press on the trunk of the vena portæ.

In the same way, if the glands in the groin or axilla enlarge in such a manner as to press on the great veins of the extremities, there will be œdema below the pressure, but otherwise it is of daily occurrence to meet with lymphatic glands of great size and hardness, without any dropsical effusion: for the tension, redness, and heat, with slight effusion, occasioned in the neighbouring cellular membrane, by inflammation of these tumours, cannot be referred to dropsy, though some writers have imagined that they saw the first pathological process towards the formation of dropsy, in this pouring out of fluid by the capillaries in the vicinity of an inflamed part.

Ascites does not succeed eruptive diseases as frequently as anasarca; and it has never occurred to me to see it alone after one of these diseases. One case I have heard of was entirely cured, even after tapping had been proposed, by the use of the infus. pyrolæ umbellatæ; and continental authors speak highly of spartium scoparium, and an infusion of the root of the ononis spinosa. When it occurs early, it is probable that its progress would be best stopped by antiphlogistic remedies and saline purgatives.

APPENDIX.

APPENDIX.

It was originally my intention to have presented to the profession in this Appendix the translation of the whole work of M. Geromini, from the original Italian. I have since retrenched the chapters in refutation of the doctrines of the late Dr. John Brown; because the opinions which gave rise to Geromini's arguments have long since faded into air. Brunonianism, soon after its appearance, exercised most extensive influence on the practice of physic in Southern Europe, and it is remarkable that this speculative theory, which neither attained great or extended reputation in the country which gave it birth, should have been looked upon with the greatest respect in Italy.

Rasori, Tommasini, and the followers of the contra-stimulant doctrines, have long since given it its death-blow: hence no reason exists for presenting a laboured refutation of its errors.

It must not be supposed that in presenting the labours and reasoning of M. Geromini to the profession, in an English translation, I coincide with him in his opinion of inflammation being uniformly the cause of dropsy: just in the principal arguments, I think he fails in establishing his conclusion. Inflammation, indeed, may have caused the visceral diseases, but it is the alteration of structure consequent on such diseases, which, in a large proportion of cases, produces the dropsical effusion.

E. J. S.

ON

THE CAUSES AND CURE

OF

DROPSY,

From the Original Italian of Dr. F. C. GEROMINI.

CHAPTER I.

Of the Theories of Physicians to the time of Brown, respecting the Causes which produce Dropsies; and also those of the great Anatomists who have illustrated (the Structure and Functions of) the Lymphatic System.

The theories respecting the causes of dropsy, established in the different medical schools, according to the respective pathological principles which chiefly governed them, reduce themselves, in point of fact, to very few varieties, including those of the time immediately preceding our own, in which these theories of the ancients, with more or less dexterity, have been reproduced.

Looking back to the time of Erasistratus, we learn from Galen and from Celsus, that this physician referred the cause of dropsy to a diseased change in

the liver, and hence rejected the operation of tapping, as unnecessary. Hippocrates held, that dropsy was generated when the liver was impregnated with pituitous humour: and notwithstanding that, in the first book de Morbis Mulierum, he described a dropsy from affection of the spleen, he states clearly, that "hydrops ab hepate oritur quum ad hepar pituita accesserit, eamque hepar exceperit et humectum redditum fuerit."

From thence Galen, and the immense crowd of his followers, established, that the cold temperament of the liver, generating, instead of good blood, both pituitous humour and water, was the cause of every dropsy.

Aretæus, the Cappadocian, who left so accurate a description of the dropsy, appears to make it consist in a higher degree of cachexia, in which the degenerated fluids change into water.

But the cold temperament did not please Alexander, Trallianus, Avicenna, Cardanus, &c., because they were obliged very often to treat the disease with refrigerating remedies: hence they decided that dropsy proceeded from the opposite temperament.

Trincavellus, all-faithful as he was to the doctrines of Galen, confesses that sometimes the dropsy succeeds, "ex jecinoris inflammatione, et ex inflammationibus aliorum viscerum, præsertim mesenterii gracilium intestinorum."

At length other practitioners perceived that this was not always associated with diseases of the liver, but

other alterations of almost any viscus accompanied it. Piso, Sennertus, Riverius, decided that the cold temperament of the liver might well be the cause of anasarca, in which a general poverty of healthy blood was discerned, but not of ascites; and leaning on the authorities of Hippocrates and Aristotle, in reference to the use of the abdominal viscera, attributed it most frequently to a defect in the power of collecting the superfluous humidity, which arose, moreover, "aut extinguendo, aut suffocando, aut dissipando calidum innatum," not alone from the liver, but also from the spleen and kidneys: the first, Piso, having excellently observed, that "tumorem aliquem alterntrius visceris ferè unam esse certe frequentissimam ascitis parentem." Here, however, serious questions arose how to determine by what means those fluids found their way into the abdominal cavity; some asserting that they dropped by "meatus insensibiles" (inorganic pores of our physiologists), and others by the extremities of the vessels of the mesentery, and more especially of the diseased or corrupted omentum, depending for proof on the anatomical and pathological observations of Columbus, Heintz, Rondelezius, and others.

Finally, setting aside the chemical and spiritual ideas of Paracelsus and Vanhelmont, and arriving at the opinions of physicians after that "Hepar dejectum fuit ab imperio sanguificationis ipsiusque publicæ ductæ exequiæ," we will speak of Willis, who, after the knowledge of the existence of lacteal and lymphatic vessels, established in reference to the causes of dropsy a very admirable complexity of opinions, which have been repeated even to our own days. Of the cause of ascites, in fact, he promulgated the opinion that it was

produced either by the effusion of the serum of the blood, or of the chyle, but especially of the former; and of this effusion of serum of the blood he affirmed, that it migh t arise either from alteration of the composition of the blood itself, or of the vessels, or of both of these; of which when "partes constitutivas intra compagem suam haud ritè continet, quin ad dissolvendum aptus, serositates suas a mixtione passim rejecit, quas vel foras per urinas, aut sudore ablegat, vel intus residere permittens, in carnium poros aut in viscerum cavitates detrudit; ovvero juxta arteriarum et venarum intercapedines aut inosculationes effluere sinitur."

Of the sanguiferous vessels, when their extreme mouths or openings "aut nimis laxa, aut processus occlusa existunt," principally when there are schirrous tumours, tubercles, and other preternatural concretions in the mesentery, spleen, liver, uterus, or any other viscus, which delay or impede the free course of the blood: reflecting, moreover, that the effused fluid not "merè serosus est, sed insuper liquor nutritivus solidisque partibus alendis destinatus; quare dum hæc regio intumescit, membra extenuantur et lympha ascitæ exempta instar ovi albuminis a calore inspissatur et albescit."

Finally, to prove that ascites may be produced by rupture, or other diseases of the lacteals and lymphatics, he reports the case of a patient labouring under ascites and jaundice from whose abdomen was extracted, by tapping, a great quantity of water, not tinged yellow, but limpid, and thence he infers "humorem istum hydropicum, non e massâ sanguinem pro-

fluxisse ; tum enim coloratus fuerit, sed e vasis lymphicis aut lacteis in abdominis cavitatem extillasse."

From which case, moreover, while we, for other reasons, as well as for this, (viz., the thin and limpid nature of the liquid,) cannot so easily accord with his opinion that the dropsy arose from the rupture of the lacteals, we may incidentally remark, that this example serves wonderfully well to prove the opinions which we are about to explain. For by admitting, as will be seen, a new morbid process of secretion from the inflamed surfaces of membranes as the general cause of dropsy, it is easy to explain how the fluid of the ascites in the case of jaundice, did not partake, in the slightest degree, of the colouring matter of the bile. But it is in reasoning on the anasarca, that Willis, repeating with his predecessors that it arises from defect or degeneration in the blood, loses himself in his chemical ideas of sulphur, spirit, and salt, wishing to shew that it is a defect in fermentation and combustion (accensione), that the hydropic diathesis consists. Etmuller leaned on Willis's opinion in his explanatiou of dropsy ; for besides admitting the rupture of the lacteal and lymphatic vessels, either from external lesion, or from the acrimony of the lymph distending and corroding them, or from the ulceration and induration of the mesenteric glands, he recognized that dropsy proceeded " exinsigni et notabile vitio in hæmatosi contingente ;" through which the blood " attenuatus et resolutus, tandem certis in locis decumbit et extra vasa cum vehiculo seroso subsistens tumorem talem infert." Nor does he omit, however, the other cause, viz.,

the impeded or retarded course of the blood in the sanguiferous vessels, supported by the famous experiment of Lower. Nor are the opinions of Lister very different, who states in these words the origins of dropsy :—

" Chylus a vitiato ventriculo ejusque digestione cruda et imperfecta lentescit unde a venis lacteis parum et nihil purgatus, cordis sanguinisque adeo motum impedit, inque venis primum lymphæ ductibus, ubi motus cruoris circumacti languere incipit, segnescit, accumulatur, corrumpitur."

But Morton considered decidedly, that dropsy could arise from rupture of the chyliferous and lymphatic vessels, caused by the swelling of the glands of the abdomen, of the thorax, of the limbs, " per quas illa vasa perrepunt et suffulciuntur ;" and that from this effusion of chyle or of lymph, the blood " solitâ instauratione privatus valde depauperatur accessit et incallescit." Hence the fever, the thirst, the wasting of parts. The history, however, which he reports, in order to prove his opinions, demonstrates a very different state of things. It respects a child who fell ill of pneumonia, in whose case bleeding was omitted, until the author was sent for very late in the disease, as he assures us that the condition of the patient did not improve after bleeding and blistering, but towards the conclusion hectic fever and ascites arose, which increasing daily, the patient died, greatly wasted.

The lungs (says the author) were healthy, except at

the posterior part, where were found "tubercula seu glandulas pulmonales valde tumefactas," which, by compressing (as he thinks) the thoracic duct, and impeding the progress of the chyle, occasioned the rupture of the lacteals, and hence the continued chylous effusion which constituted the dropsy. Every one sees in this case, that this rupture of the lacteals, however much the illustrious author treats it as certain, is purely hypothetical: nor do we believe that any one, whatever may be his faith in, and veneration for, Morton, will believe it, as Vanswieten did, solely on his word, without even knowing if he had employed the usual anatomical contrivances to prove the truth of it; the more so, as it is known from Monro and others, how very difficult, if not impossible, rupture of the lymphatics would be. We believe also, that no one would maintain, on such slight foundation, that these tubercles on the posterior surface of the lungs could in fact compress the great duct of the chyle, so as to obstruct it in its whole course. On the contrary, who does not clearly see, in this pulmonary disease, a manifest indication of preceding inflammation, and from this the cause of the dropsy?

Sydenham hastens over the subject admirably, and urges that "causa hujusce morbi in genere, sanguinis debilitas est, unde alimento quod forinsecus importatur in substantiam suam convertendo non jam par, idem in extremitates et pendulas corporis partes explodere necesse habet et in abdomen etiam."

Again, in considering the opinion of the great Hoffman, (that physician of exalted talent, formed in the

accurate school of Leibnitz, whose works we deeply deplore should be neglected by the greater part of young physicians, since in the midst of no few errors incident to his time, they would find great lights of truth, and many of the seeds of the opinions of Cullen, and of the recent theory of excitability,) we may observe, that the same experiment of Lower, which suggested to Willis, Etmuller, and Lister, the idea of the retardation and stagnation of the blood in the sanguiferous vessels, as one of the causes of dropsy enumerated by them, moreover led the more sagacious and ingenious Hoffman to establish, in that alone, the explanation of the production of the disease; and although he has embellished this theory, and rendered it not a little attractive in reference to the anasarca, that the blood suffers retardation in returning by the veins to the heart, and because it flows against the force of gravity, and because "venarum tunicæ non tanta vi systaltica et motrice elastica præditæ sunt quam arteriæ;" to which he adds both their natural and morbidly increased tenuity and porosity, in consequence of which the light serum might easily transude; which opinion he moreover extends to explain the formation of ascites, amplifying beyond reason the disadvantageous condition of the circulation in the liver; in regard to which, resting on the observations of dissections, he retains the opinion of the ancients, "præcipuam ascitidis sedem;" this theory, we maintain, although not without the appearance of truth, did not accord sufficiently with just reasoning and an accurate analysis of facts: and in truth we must confess we cannot so easily imagine how, during the retardation of the circulation in the veins,

the more subtle portion of the blood must transude through their coats. It is true there may be pores common to the whole body, and also those which have been added by physiologists, and termed inorganic: it must, however, be clear, even if this transudation could happen, it demands on the one part an enormous force to compress internally the column of fluid, and on the other an absolute impediment to the smallest progress of the circulation. Now the first (the compressing force) cannot be imagined in the slightest degree, if the slowness or stagnation of the blood in the vessels (the second of Hoffman's causes of the supposed serous transudation as a cause of dropsy) arise from a weakness of the vessels themselves, or general debility of the whole frame. In reference to the second, a cause being assumed in any part, which, either by compression, or by any other mode, impedes altogether the circulation of the blood in any vessel, (which in truth it would be extremely difficult to verify), who does not perceive that it would be far more likely to happen that the valves should give way, and the blood take on a retrograde movement, than that its component parts should divide, and the more liquid parts transude through the coats of the vessels, however tender they might be?

But here the experiments of Lower are opposed to us; and on this head we are obliged, for other reasons, to stop a little, seeing that on these experiments Millman rests his opinions, in his celebrated work on dropsy. And first of all, to take away from these experiments a little of the appearance of their irrefragability, in the eyes of almost

all pathologists, it will not be useless to reflect, inasmuch as relates to the aqueous collection observed in the abdomen of the dog, in which Lower tied the vena cava, that the lesion of surrounding parts, which this operation must necessarily have occasioned, might have produced an inflammatory action, to which the effusion mentioned would succeed: and in reference to the tying of the jugular vein, (second experiment of Lower), that this does not form the same case as that in which there was an obstacle to the circulation of the blood in the other veins of the body; since, in the one case, it would be altogether difficult for the blood to recede, because it would have to overcome its own gravity; but not so in the other.

To which observations if it be added, that perhaps in practice the case can never occur of an obstacle to the circulation of the blood, perfectly resembling that arising from the experiment of Lower by ligature, every one sees how much is detracted from the importance which the greatest pathologists have attached to these experiments in the arguments on the causes of dropsy.

And if, moreover, it should be wished that we should explain the formation of dropsy, according to the experiment of Lower, we must recollect that, having shewn the desired serous transudation through the coats of the vessels to be impossible, merely from an obstacle to the circulation of the blood, we may reasonably assert, either that the dropsy which succeeded to these experiments, is not explicable, or that the most pro-

bable explanation that can be given after the preceding reflections, is, that the ligature disturbing necessarily the natural deposition of molecules in the coats of the vessels, had excited in them an inflammatory process capable of generating the serous effusion which occurred; the more, that from the observations of Hunter, Abernethy, Sasse, Frank, the possibility of the inflammation of the sanguiferous vessels is placed beyond contention.

It is clear, then, that even allowing that an obstacle to the regular progress of the blood in the vessels accompanies, or, if you will, even *remotely* occasions, dropsy in any part, this does not prevent inflammation (flogosi) being proximately the pathological process which generates this disease, as we shall go on making more clear in the progress of this work; the more, that we shall shew in their place that those organic alterations are produced by inflammation, which, through the knowledge which we have of the laws which regulate fluids out of the living machine, here appear to exercise their morbid influence as mere obstacles to the free circulation of the blood.

At present we must treat a little of another illustrious writer, Sauvages, one of the most ingenious partizans of the Stahlian doctrine. But inasmuch as he recognises dropsy to be simply a genus of cachexia, which we have already seen to have been the opinion of Aretæus, we shall occupy ourselves with his theory on another occasion, when we treat expressly on this last morbid condition; demonstrat-

ing how very erroneously physicians have made a particular disease of it, while the signs of it which they describe are merely symptoms of various forms produced by inflammation. Proceeding instead to Boerhaave, and his illustrious disciple, Vanswieten, in whose much esteemed commentaries, although we cannot expect in fact to discover new ideas on the theory of the disease on which we are occupied, (as Sprengel wisely observes, they are a mere collection of humoral, chemical, and dynamic principles), or any thing beyond the already expressed ideas of retardation of the circulation, superabundant serosity in the blood, thickening and viscidity in the lymphatic system, vascular and visceral obstruction; we shall begin to find joined to these, the increase in the natural transudation of the membranous surfaces, or their defective absorption, supported by the much-praised work of the celebrated Kaaw, nephew of the great Boerhaave, and in some measure acknowledged even by Mead. Nor did the great Morgagni think differently, since he maintained with the other physicians, in reference to the causes of dropsy, "Quæcunque causa diutius potest sanguinis aut lymphæ cursum morari, aut humoris quo caveæ corporis madent præter modum aut secretionem augere, aut exitum deinde imminuere morbo huic potest originem præbere." Afterwards, a celebrated physician of Leipsic, Ludwig, was the true precursor of the Scotch reformer, Brown; for, in the midst of the old principles of the humoral pathology, acknowledging the principal cause of these diseases, and particularly of dropsy, to be general debility or atony of

vessels, and of all the animal machine, he established the first curative induction of this disease to be in the use of stimulants and corroborants.

"Vera itaque," he says, (in his Adversaria Medico Practica) medendi ratio ad sola roborantia ducit. Circulus nimirum universalis in systemate arterioso primum sustinetur ut crasis sanguinis bona hujus vigore efficiatur, et quem admodum etiam venarum vis in suggendo roborantibus medicamentis incitatur sic bona etiam mixtio sanguinis a venis suscipiendi expeditam reddit resorptionem."

Also Milman, in his explanation of the formation of dropsy, adheres especially to general debility, although he reduces to three kinds the causes which induce the malady.

"Scilicet ad fibrarum laxitatem, ad vires magnis evacuantibus, morbisve acutis, in longum protractis, demissas, vel ad impeditum revolubilem sanguinis circuitum."

The theory of debility or atony, as the proximate cause of dropsy, we find afterwards followed up by the celebrated Vogel. But this physician prefers restraining it to the lymphatic system. "Multos enim, (thus he expresses himself) cachecticos ab hydrope prorsus immunes esse video vicessimque hydrope saccato laborantes satis alacres omnisque cachexiæ certè per longum tempus expertes."

Further on he adds, that "Si languor saltem

illis vasis incumberet, quæ ad demittendos humores serosos destinata sunt, certè non difficile est intellectu quomodo hoc in casu oriri hydrops possit."

But a real, and not the less elegant, amalgamation of all the opinions of writers hitherto enumerated, is Cullen's theory, in his Elements of the Practice of Medicine. In fact, after having published, as other pathologists of that time did, that dropsy succeeded either from increased exhalation or defective absorption, he laid it down that this took place either by the bursting of the vessels conducting the serous fluids, or the little sacs which contained them; that is, not only by rupture of the lacteals or thoracic duct, but also of the ureters, bladder, &c.: the natural exhalation also, according to him, becomes increased.

1. From causes impeding the return of venous blood to the heart, and thus preventing the free passage of blood from the arteries into the veins, in consequence of which the fluids contained in the arteries find more easily an exit by the exhalent vessels: and as causes for this he enumerates the polypous concretions in the right ventricle of the heart, the ossification of the valves, the pulmonary hepatization, obstruction of the liver, polypi, swellings formed in the veins, compression of the veins by aneurismal tumors, abscesses, schirrous or steatomatous tumors in neighbouring parts, or pressure made by the gravid uterus.

2. From want of tone in the exhalent vessels, the consequence of the general atony of the system,

occasioned especially by the abuse of spirituous liquors, to which he gives the name of hydropic diathesis.

And here we must remark, that facts themselves oblige the author to add plethora as sometimes producing dropsy, principally when it succeeds to the suppression of some natural or sanguineous discharge; but in truth he thus embarrassed a little his preceding theoretical opinions; to make up for which, he adds the superabundance of serum in the sanguiferous system, derived either from the extraordinary quantity of water introduced into the body by drinking, or absorbed from the atmosphere, or from the diminution or cessation of the natural serous excretions, or from copious hæmorrhages, as well spontaneous as artificial, not less than from a defect in assimilation and sanguification.

The natural inhalation afterwards, must, according to this author, be diminished or even destroyed, from the enfeebled action of the extremities of the lymphatics necessary to absorption. And this weakness in the inhalent action of the lymphatics may be, as he thinks, either altogether peculiar to this system of vessels, (and thus he thinks that some of the active remedies in the cure of dropsy effect it by exciting specifically the absorbents), or dependent on general atony.

And here it appears he rejects the obstruction of the lymphatic vessels and glands, commonly reputed

as one of the causes of dropsy, assuring us that he has seen similar cases, in which the larger part of the mesenteric glands were much obstructed, although the passage of the fluids was not visibly obstructed from the lymphatic to the sanguiferous vessels, and dropsy was not the result.

In reference to the hydatids observed by the ancients, and especially by Schenkius, as constituting various forms of dropsy, he is of the opinion of those who consider them to be animals. This union of the hypothetical principles of the solid, humoral, dynamic, and chemical philosophy, constituted the theory of this disease, as well as of every other, in the works of Stoll, Dehaen, Storch, Quarin, Borsieri, and in all the treatises and compendia of practical medicine of the second half of the eighteenth century: then appeared the system of Brown. But as we must occupy ourselves with this separately, we will proceed to the opinions on the formation of dropsy conceived by some of those meritorious anatomists who have illustrated the structure and functions of the lymphatic system. Cruikshank distinguishes three species of dropsies: the first arises from the debility of the whole body, and consequent relaxation of the extremities of the arteries, and atony of the absorbent vessels: the second, from inflammation which has preceded, and which has increased, the serous effusion: the third, from the retardation by some obstacle of the free course of the blood in the venous system; and it is from this last cause that he maintains with Plater and with the ancients, that the extremities of pregnant women, as well as those of persons who travel sitting in a carriage,

or on horseback, swell; and that œdema succeeds the use of splints or bandages in fractures, when applied so as to compress the veins.

But the eminent anatomist of Germany, Soemmering, maintaining that every dropsy depends always on some disease of the absorbent system, prefers attributing the before mentioned morbid conditions to compression of the lymphatics, rather than that of the veins, supporting himself on the experiments of Basilewtz, De Cagnion, and on his own. But among these, in truth, what proves far otherwise than was intended, is the inflammation of a furuncle on the dorsum of the penis, which, by *irritation of the absorbent vessels*, occasioned an œdema of the prepuce, which disappeared by degrees, when the furuncle had entirely vanished. Here, then, it would appear that he believed something more than mere compression to have produced the œdema. But what positive idea can we ever make to correspond with the expression *irritation*, up to the present time so vaguely employed by medical writers; and if the least equivocal meaning which can be attached to it, is, as we see, that in this state the mobility of the fibres is increased, the inhalent action of the absorbent vessels, far from diminishing, ought also to increase; any thing, rather than œdema, ought to be the consequence: instead of this, nothing is more obvious to the mind than that the œdema was effected and kept up by inflammation, in the same way as every other species of dropsy is, as we are about to demonstrate. Nor ought the inflammation, in the particular case, to have been trifling, as the author clearly adds, the part was

dreadfully painful, and that stranguary, fever, delirium, and convulsions, were present.

But what shall we say afterwards, of the explanation given by the same illustrious author, which he thinks he makes with some appearance of probability, of the reason why those addicted to spirituous liquors become attacked at last with incurable dropsy, stating that it arises in consequence of the spirituous liquors by degrees condensing the lymph, until obstruction of the glands is produced. In truth, such a chemico-humoral idea could scarcely be pardoned in Willis; and on this subject it does not appear to us clear, how the physicians who have all spoken of the abuse of spirituous liquors as the cause of dropsies, have passed over the examination of intermediate actions, which constantly occur between this occasional cause and its effects, viz., slow abdominal inflammation; and thus they have let escape, by erroneous observation, by a less than rigorous analysis of facts, the means the most obvious for revealing the true cause of the formation of dropsy. In fact, also Cullen and Brown, far from recognizing, by means of these facts, how erroneous were their preconceived ideas of debility being the proximate cause of dropsy, by explaining its formation from the abuse of spirituous liquors, which are essentially stimulant, established a principle the absurdity of which we have demonstrated—the one calling it atony, and in the language of Brown, indirect asthenia: but in reference to this last we are to speak in another place.

The great Mascagni, to whom belongs, as is well re-

marked, by the clear and luminous Tommasini, "the discovery of the lymphatics, born in Italy by the labours of Asellius, fostered afterwards beneath foreign skies, and since returned to the land which gave it birth, there to receive perfection," divides dropsies into two classes: the first is the effect of the obstruction of the glands; the second, of the dilatation of the lymphatic vessels, in consequence of which the valves no longer impede the return of the absorbed lymph. But, in truth, these causes are not supported by any proof; for, in reference to the first cause, besides the fact that we do not often meet with the glands of dropsical patients obstructed, as Cullen, Monro, and Soemmering, assure us, it is certain that when they are found changed or degenerated the disease is accompanied in the same dropsy with visceral obstructions, which attest unanswerably the presence of a preceding inflammatory process; and we are obliged to recognize in that very process both the origin of the dropsy and of the glandular disease just noticed.

To the second cause may be opposed the abortive efforts to inject the lymphatics from the trunks to the branches; although it is maintained by anatomists that dropsical subjects presenting the lymphatics much enlarged, and much more visible, are better adapted for the investigation of this system of vessels.

Finally, Walter, who, together with other illustrious anatomists, denied to the lymphatics the office

of absorbing the fluids from the different cavities of the body respectively—attributing this function rather to the veins, whose extremities he believed to be free, and absorbing over all the surfaces—imagined that the cause of dropsy existed solely in increased arterial exhalation.

CHAPTER II.

Of the sensible and well-known Morbid Processes, which produce an effect similar to Dropsy.

From among the morbid processes which we see under our immediate observation produce a pathological condition similar to dropsy, we will choose the serous collection that manifests itself under the epidermis, like a bladder, whenever a plaster of cantharides, or euphorbium, or ranunculus, or any other epispastic, has been applied during a sufficient length of time; or that a part has been repeatedly struck, or scalded with some boiling fluid. We know not where to find facts which more clearly, or under our own eyes, disclose the real nature of dropsy. But it is moreover true, that the most obvious sources of knowledge are precisely those most neglected by mankind, as unworthy of their sublime and transcendant investigations. In fact, in these very cases, in which the blind may convince themselves of the inflammation which always precedes and produces this cutaneous dropsy, no one has ever run away with the idea that the dropsy succeeds to the impeded transudation of the perspiration: no one has hitherto gone

the length of saying, that the effect of blisters of cantharides applied to the skin (irritants similar to burns) arises from their action moderately contrastimulating. And does it not appear impossible that, in this case, it should not be thought absurd, that inflammation should be the effect of a contra-stimulus? and that this serous collection of which we are treating, is really the result of inflammation, we can demonstrate even by the examination alone of the first and successive effects which succeed to the application of condensed caloric, or of any other of the before mentioned irritating causes. If, in fact, the caloric applied to the skin is slight, nothing succeeds except increased action in the circulation; the part becomes red, is painful, and sometimes it swells; in a word, the first symptoms of inflammation manifest themselves, or some of its most sensible conditions, which, moreover, disappear either simply by removing the external cause, or by using one or other of the means which weaken the organic forces, and particularly by those which subtract caloric from the animal system. If, however, the heat applied is great and long continued, there is inevitably produced a degree of inflammation which causes the effusion of fluid contained in the vesicles of burns; if it be very great, it destroys immediately, produces mortification by a peculiar and perhaps chemical action, and in another degree causes suppuration, and hence the reproduction of the destroyed substance: from which circumstances it is easy to collect, that the serous effusion is undoubtedly produced by inflammation, and that it is only necessary to have a given degree of inflammation to cause one or other of its products.

At present, having established this truth, any one has a good right to the deduction, if "iisdem effectibus eædem assignandæ sunt causæ," that also dropsy must owe to inflammation the primitive pathological cause which generates it; but if any one should think the induction not sufficiently rigorous, inasmuch as the resemblance is not sufficiently proved between the fluid of dropsy and that produced under the skin by the application of blisters, or of caloric in a greater or less degree of condensation, he may, in fact, dissipate his doubts, by the knowledge that the resemblance between the two fluids is not limited only to their sensible characters, but is supported by the similar conditions of their component principles, since both one and the other contain gelatine and albumen: when made to evaporate, they leave an albumino-gelatinous substance, more or less white, and which coagulates when treated with acids.

But besides the artificial morbid process, a natural one may be mentioned, which also generates a product evidently similar to that which constitutes a dropsy. In the herpes zoster, a malady which consists simply of cutaneous inflammation, is there not a serous effusion produced—a dropsy similar to that caused by burns, or the application of blisters?

CHAPTER III.

Of the Diseases which frequently precede and generate Dropsy.

All the various forms of erysipelatous inflammation with which we were occupied in the first part of this work, may give rise to dropsy ; and here we speak as well of those which attack the skin, as of those which affect the internal membranes, which constitute certain parts, and involve and confine others.

Relatively to the cutaneous diseases, we have already seen how many impetigines, indicated under so many names by nosologists, are no other than so many various forms of inflammation, for the most part erysipelatous ; proved by the pathological laws which they follow, and which are distinctly marked, and shewn in a positive manner, and not at all hypothetically, by their manifesting themselves alternately over the external surface and in the interior of the human body : hence, where is the marvel that, when improperly treated, they should give rise to dropsy of the integuments, of the tunica vaginalis, of the abdomen, the thorax, or the encephalon ?

But proceeding to the exanthematous diseases, the most common among the cutaneous inflammations from which dropsy is generated, as is attested by the celebrated Pietro Frank, we will speak of scarlatina, of which it is so common a result. Now, as we have demonstrated unanswerably, when treating of the different forms of erysipelatous inflammation, this disease is a decided inflammation of the surface, and even approaching a real diffused erysipelas, and hence succeeds to similar causes, follows the same laws, produces the same results, and is cured by the same remedies: when enumerating the morbid products also, we have recognised the serous effusion which constitutes dropsy to be the principal one. And in truth, in order to demontrate this fact, too often repeated, it is not necessary here to have recourse to authorities, as cases occur daily to every practical physician, as is asserted by the before-mentioned master of his art, that "Copiosos nos non cellulari modo hydrope, sed et ascite ac hydrothorace affectos, post scarlatina tractavimus."

And in reference to these two last species of dropsy which follow scarlatina, we must believe that the production of them is clearly to be understood, since we have demonstrated, by daily experience, and with the support of the best-established observations of the best authors in practical medicine aud pathological anatomy, that it is peculiar to this form of inflammation, and those similar to it, to attack not only the integuments, but at other times the internal membranes which compose or involve some of the viscera,

as is demonstrated by the alterations observed in post-mortem examinations.

Neither do we fear any opposition from the followers of Brown, or the first reformers of his doctrine, arising from the supposed asthenic diathesis, which scarlatina itself will sometimes assume in common with the other exanthemata: since we have demonstrated evidently, 1st. That this disease is phlogosis; 2dly. That phlogosis, meaning always increased organic action, is opposed to asthenia, (and even, if we must apply one of the Brownian visions, diathesis) it might be said in a certain sense that it is the intense condition of the sthenic diathesis, hence always the same, as is the opinion of Professor Tommasini; and this we may assert with more confidence, since we have availed ourselves of the same materials on which the Brownian pathologists rest their force, and the very authorities on which they depend.

Moreover, in reference to the *scarlatina maligna*, or *angina gangrenosa*, from an accurate analysis of the observations of Huxham and Fothergill, and which we have applied also to those of Ballonius, when treating of pneumonia, called malignant, we have placed beyond any doubt, that very far from being accompanied or produced by an asthenic state of system, it is there where we recognise the highest state of inflammation, which rapidly changes and disorganises the affected part. Hence, since it is wholly useless to maintain that, in the dropsy of scarlatina the curative indication is to excite, it rests with the Brunonians to say, that it succeeds to the asthenic diathesis, or

when the sthenic becomes changed into the asthenic: absurdities of the system of the Scotch physician, and by errors of observation, confirmed by names otherwise illustrious and venerable. And truly, although by one of them it is said, that dropsy succeeds to scarlatina, from the time when it is treated with repeated effusions of blood, we can moreover maintain that this is a real error of observation. And in fact are not the common people to be pardoned, when they believe that dropsy produced by scarlatina, where blood has been taken, has succeeded this evacuation of the humours? And would it not be the same to say, that in one dead of pneumonia, in the course of which disease bleeding was employed, that the bleeding was the cause of death? But much more just would it not be to judge, that the death in this case, and the dropsy in the first, had succeeded from the bleeding not having been employed in time, and in sufficient quantity, to cut short the inflammation, which in one case has produced disorganization in the lungs, in the other a secretion of serum? And why is this unfortunate result of the scarlatina in fact less frequent in these days than it was formerly, unless, that among the more obstinate physicians, and those attached to prejudices, which the tyranny of the humoral pathology exercised over the vulgar, those who are conscientious are getting rid of them, and at present use in the cure of the same disease a more active antiphlogistic regimen. And if any one should be disposed to raise no small difficulty to our manner of considering the production of dropsy after scarlatina, by saying that it often arises in those who are already recovered, we would excite our adversa-

ries to examine a little more scrupulously the state of their patients, from whence they may infer, that although in those cases in which the scarlatina appears to be cured, the vascular system has not returned, and that of the integuments especially, to its natural condition; since even the celebrated Frank assures us that he saw it arise in those "quibus desquamatio a scarlatinâ rite peracta non erat."

We maintain, then, that if the scarlatina is always an inflammation, the dropsy also which accompanies this disease is undoubtedly an inflammatory process; since it succeeds to all the other forms of exanthemata; and all that we have already said in reference to the production of dropsy must be extended to that which arises, as we are warned by Frank, (whom we have so often praised), "ab aliis quoque morbis exanthematicis vix superatis, ut a morbillis, atque miliaribus."

Another form of erysipelatous inflammation, which frequently precedes, and gives origin to the dropsy, is that of the gout and rheumatism, as we have recognised when treating on this subject, supported by daily experience, and by the authority of Hoffman, of Musgrave, Sauvage, Boerhaave, and Vanswieten. And here, still more, shall we support the confutation of the humoral pathology, on which we were occupied in the same place, examining the form of inflammation which accompanies gout, on which the humoralists had truly much to rest, not disturbed by any of the most zealous propagators of the theory of excitability; especially if we take into consideration the

phenomenon of its alternate production in one part of the body and in another.

But having collected together very many other facts similar to these, which relate to other forms of disease—seeing all these appertain to simple inflammation, (however various might be the appearance, and the occasional external causes), and more especially to that kind of inflammation termed erysipelatous—we were enabled to deduce the expression of all these facts, in the event of single cases served to explain them, without rendering it permissible to have recourse to any hypothesis of humoral or spiritual transference: explanations which, up to this time, pathologists could not fail to resort to. On this very law, then, established by means of facts appertaining to well-known forms of inflammation similar to those of gout, (the disease the nature of which we wished to establish), together with the analogy of their symptoms, causes, and cure, we were enabled to rest the inflammatory nature of the disease; declaring in consequence, that gout was nothing more than a mere membranous inflammation, and hence of the nature of erysipelas. It remained, then, to give the last blow to the hypothesis of an unknown humour as its effective cause, and establish our own view in the clearest manner—to make an accurate examination of the pathological results: and among these the serous effusion which constitutes dropsy, and which succeeds in the different parts to gout, is the principal and most frequent.

Now, as we have proved, placing beyond a doubt,

by means of the examination of many other forms of disease certainly inflammatory, and which generate dropsy, that this serous collection is produced by inflammation: thus also by the same means, while adding an argument to the theory of the inflammatory nature of gout, we derive another, from the morbid collection of fluid produced by this as well as by the other forms of inflammation, in favour of the uniformly inflammatory nature of dropsy, and thus observing nothing else in this consequence of the gout but a simple dropsy, or one of the various processes of inflammation, we may "extremas ducere exequias" of that unknown arthritic humour, the existence of which has been maintained with so much boldness by the humoral pathologists.

Finally, we may add, that gout attacking not only the membranous portions of the articulations, where it often produces hydrarthus, but, at other times, the internal membranes, and the viscera of the human body, we have thus another argument to prove that the gout is a simple inflammation, and the succeding dropsy nothing more than one of the common products of inflammation, especially membranous, from the examination of the other alterations, which, with the same serous effusion, is observed whenever that form of inflammation attacks the internal membranes —the peritoneum, the intestines, the pleura—the membranes of the brain, which (in persons dead from gouty metastasis to the interior) are found thickened or covered with puriform fluid, or with a layer of coagulable lymph, and beneath it are seen either red

or livid appearances, which are at present believed by all the best physicians to be undeniable traces of the inflammatory process which has preceded.

Proceeding to consider the other forms of disease which attack the viscera, and which are acknowledged by physicians to arise from real inflammation, we shall find in all the writers on medicine, from Hippocrates to our own times, that among the different products of this morbid process they have observed the accumulation of fluid which constitutes the various kinds of dropsy.

But as even these very forms of inflammation, although the clearest and most constantly distinct, have their development and their progress obscure and masked—as, among others, was observed by Stoll, and is proved by Wrenhold and by Shroeder, in their excellent dissertations on this subject—so it is not to be wondered at that they often escaped observation, as any one may assure himself, examining critically, and with a scrupulous analysis, the cases relating to the subject transmitted to us by practical physicians and by observers of pathological anatomy, in their condemned volumes, and afterwards comparing, at one and the same time, their obvious product, dropsy ; the cause of which they had sought for by a totally different method.

And truly, only two extreme points for consideration falling under their observation, in the midst of which they saw dropsy—the first regarding some remote causes, which, moreover, are either accessory

and independent, or occasioning the hidden inflammatory process in this or that viscus, as will be seen when we treat of the causes which physicians have assigned as producing this malady; the other point regarding the alteration in the viscera, observed in the dissection of those who have died of dropsy: the opinion certainly was obvious that they found in the one and the other the causes generating dropsy; the more so, that in the second they did not perceive any thing except chemical or humoral degenerations, or *error loci*, irregularity, or sluggishness of the circulation, instead of merely inflammatory processes, as will be demonstrated in the next chapter, in which we shall be occupied with the organic alterations which all physicians have observed to accompany the dropsy. But the most accurate reasoners ought naturally not to be completely satisfied with these, the doubt always remaining whether these organic alterations which occur, were not an effect rather than a cause of dropsy, and the more so, as, often with dropsy, the usual visceral degenerations are not found, and *vice versâ*. Hence we see some reject, as a cause, the disease of the liver, which being in reality the most frequently met with in dropsy, was the most frequently maintained to be the cause of the disease. Moreover, it is for these reasons (these two points falling under their observation) that some lights of truth are found in all the books, in the midst of many errors on the cause; since even Hippocrates says clearly, "ægritudines acutas solet sequi aqua intercus"; besides very precious observations, of which we may say that nature has done every thing towards revealing the real cause of dropsy; and whilst physicians

found in all the books of practical medicine, and of pathological anatomy, that to enteritis, peritonitis, hepatitis, splenitis, succeeded either anasarca or ascites; to pleuritis, hydrothorax; to encephalitis, hydrocephalus; they could not recognize inflammation as the cause, when this or that dropsy was presented to their sight, unless they had been able to distinguish the preceding inflammatory process, because it was not manifested with the usual decided and marked symptoms.

But the physicians the nearest our own times, the Brunonians, who on this subject ought to be better instructed than the ancients—thanks to the labours of the deserving writers of the second half of the eighteenth century—although they saw more clearly the visceral inflammation which preceded dropsy, yet they still believed in the absurd idea of "indirect asthenia," of the change (of which they admitted all inflammations to be susceptible,) from the sthenic to the asthenic diathesis, in order to find a support for their beloved theory in asthenia, as the proximate cause of all dropsies, until the great master of his art, Pietro Frank, following the footsteps of Stoll, cured, as we shall presently see, several forms of dropsy with bloodletting, and with neutral salts, which the first Brunonians strenuously avoided, from which he established that sometimes one of the Brunonian diatheses, and sometimes another, may be the proximate cause of this disease, not less than of all other morbid appearances.

CHAPTER IV.

Examination of the nature of the Fluid of Dropsy, and also of that which is naturally exhaled into the different cavities; afterwards of the Organic Alterations discovered in Dropsies.

Valsalva made various observations in reference to the nature of the fluid of dropsies, in order to see if the difference which existed in it could afford any means of determining its origin; and already many believed, with Bonetus, that the limpid fluid, either colourless or of a very light tint, proceeded from the vessels carrying the lymph, instead of the veins, from which was derived the serous fluid, mixed with other humours, and of the colour of urine.

But although some difference in the various sensible qualities of the fluid of the various hydropic patients, is actually admitted by Hoffman, Gmelin, Senac, De Haen, Vanswieten, and by Du Verney, in his observations on the subject, published in the Transactions of the Academy of Paris, there is nothing conclusive against our views; for besides the reflections of Morgagni, arising from the change which the

fluid taken from the bodies of persons who have died of dropsy may undergo in consequence of the longer or shorter delay, or from other circumstances attending the post-mortem examinations, it is absolutely necessary to observe, that this variety in the fluid, whether it be drawn from living cases, or after death, reduces itself to the colour, being either dark or clear, or of greater or less density, and to a greater or less quantity of aqueous or albuminous matter, and of some saline principle present in it.

But it may be maintained as certain, that in general all these varieties contain albumen, since besides it having been observed by the ancients that the fluid taken from hydropic patients when evaporated leaves a gelatino-albuminous substance, more or less white, as is asserted by Sennertus, Boyle, Willis, Etmuller, Simson, it is well known , as we have before remarked, that treated with acids, coagula are always formed in it.

Now that the presence of a gelatino-albuminous substance in the fluid of hydropic patients, demonstrated by the coagulability of that fluid, furnishes a most important argument in favour of its being a new product, and hence an equally strong objection against those who regard this disease as a mere increase of the natural fluids, is proved by the knowledge that this coagulability is not found in the other humours exhaled naturally in the same parts of the animal machine where dropsy is generated: on this subject, in fact, passing over the authority of Sarcone, who says clearly, —" The aqueous vapour

which exhales from the organ and exhalent arteries does not shew (when collected from a healthy body) any signs of coagulability whether exposed to heat or examined in the natural cavities;" it is certain that Cotunnius has maintained victoriously against Lower, Lancisi, Kaaw, and Boerhaave, that the humour which exhales naturally from the pleura, the pericardium, the membranes of the brain, and the tunica vaginalis testis, is assuredly not coagulable in its nature, which is particularly proved by his observations on living dogs:—"Ex vivis canibus (he says) in hunc finem dissectis pericardii vaporem quoties detraxi atque ad ignem exposui, toties prorsus in auras sine ulla, vel levi crustæ specie residua, visus est evanuisse:" the same is said of that fluid, "ex viventium canum abdomine, desumptus, qui et limpidus et recens, et fere inodorus ut labem nullam videretur contraxisse, igni expositus, sine ullo discrimine totus evanuit; quæ sors testium etiam vaginæ vapori contingit.

And, in fact, it is on this point that the truth must be sought for in living animals, since in human subjects it is difficult to exclude the suspicion that the fluid may have arisen from disease as often as not: hence it is not to be wondered at that Lower, Lancisi, and Kaaw, found it to be coagulable; and so it is, as Cotunnius observes, each time that it is found, "præter naturam adauctus." Hence "patientibus hydrocephalon, solet cerebri aut spinæ vapor coagulo imbui: in pectoris hydrope collectæ aquæ coagulum excipiunt; nec minus illæ quæ sive pericardii, sive abdominis, aut vaginæ testium, hydropem constituunt."

And here it is observable that this illustrious writer does not recognise the acquired coagulability of these fluids to depend on an increase of the natural exhalations, but gives of it an explanation, which, although a little too mechanical, supports wonderfully our theory of the inflammatory origin of dropsy.—"Si enim, (he says,) ampliora excernentia essent vasa ac natura solent, copiosius aquam, unaque crassius serum et coaguli capax facile trajicerent uti reapse trajiciunt cum *auctis vitæ viribus* præter modum distenduntur."

We may reflect in passing, that this explanation, which is moreover the one which in this medical school is given of inflammation, although very ingenious, nor assuredly improbable, yet as it establishes a vascular condition which cannot be sensibly demonstrated to exist, and against which some facts may militate, so it will be sufficient for us to retain that portion of it which shews that this morbid collection of coagulable fluid is generated by a new secreting process from the inflamed membranous surface of the part in which it arises.

To this point truth assists us: if we would go further to explain the mode in which it forms, and in what consists the inflammation which generates it, we should relate only hypotheses, and repeat in a more or less neat manner the very same which have been already related, since physicians began to write about medicine; and, before quitting this subject, the qualities of the fluid, morbidly collected, which constitutes dropsy, (the most important of which, and which distinguishes it from the humours in a

healthy state, and naturally exhaling from the same parts, is the presence of certain substances which may be made to concrete,) we shall take leave to make a reflection, which, besides demonstrating still more its inflammatory origin, may serve to give a convenient explanation of the before-mentioned variety in the sensible qualities of the water of different dropsical patients; and this is, that since, in all the products of inflammation there is seen in greater or less quantity the albuminous matter which may be concreted, thus (besides having a strong argnment to maintain that the presence of that animal principle in parts where it did not naturally exist, indicates a preceding inflammatory process) it appears to us to be most probable, and we shall go on still further demonstrating it in our progress, that in these the difference of the quantity depends on a different degree of inflammation, and the different form which those products assume of aqueous lymph, pultaceous lymph, mucus, false membranes, polypous, and osseous concretions, are owing, besides the various degree and cause of the inflammation, to the difference in the occasional causes and the nature of the affected parts.

And in truth also there appears visibly to exist a certain gradation in the composition of these effects of inflammation which demonstrates an equal relative gradation in the severity of the inflammation which produces them, since even on the surface of the body fluid is seen to collect after a slight inflammation and from slight injuries; the process, on the contrary, being severe, when induced by severe or violent causes. For which reasons, besides the means of very

reasonably maintaining that dropsy is one of the products of inflammation, we may also establish these other facts :—

1. The dropsical fluid, which contains less than in other cases of dropsy the principle of coagulable albumen, is one of the most simple forms, and hence the result of a slighter inflammation.

2. That the variable quantity of the same animal principle occasioning the obvious varieties in the sensible qualities of dropsical fluid, depends, as we have already remarked, on the variable degree of inflammation which has produced it: and is it not shewn by the fact that the denser and deeper coloured fluids containing a greater quantity of coagulable principle, and thus acknowledging a more severe inflammatory process as a cause, has induced physicians to declare that such a condition affords an unfavourable prognosis?

But the morbid inflammatory process which produces dropsy in different parts of the animal machine, is very often not limited solely to the production of fluid which constitutes this disease, but in proportion to its severity gives rise also to several other more complicated forms of the products of inflammation, which are often found at the same time with dropsy.

And already we have remarked, that from the time of the most ancient physicians, different visceral alterations were found co-existent with dropsy: but by these little was remarked, except the most obvious ex-

ternal appearances; hence described by the unmeaning appellations of obstruction, swelling, or the still more vague word corruption, while their real origin was not established, as we have shewn, except by some of the best writers of the second half of the past century, and above all by means of the late pathological investigations of some of the illustrious zoonomists who at present adorn Italy.

In fact, passing over Columbus, Heintz, Rondelezius, Bartolinus, Peyer, Trincavelli, Sennertus, Willis, Piso, Zacutus, Riverius, Etmuller, Morton, Littre, Sassonia, Plater, Horstius, Tulpius, Ruischius, Bonetus, and a thousand others, who in their observations on this disease speak to us in the already mentioned language, in reference to the organic alterations occurring in cases of dropsy, either in the abdomen, or the chest, or the brain, we come to the great Hoffman, who leaves us nothing better, saying of the liver that "plerumque morbidum fuisse repertum, et nunc quidem pallidum et fere exangue, nunc tumidum et atrum, tensum, schirrosum;" and of the other viscera, "omentum in dissectis ascite defunctis ut plurimum inveniri corruptum et sphacellatum vel plane extenuatum et absuntum, pancreas schirrosum, et mesenterium obvesicas quibus interius obsidere solet, aquâ repletas, et glandulas ad fabæ magnitudinem tumefactas, in magnum molem excretum;" and it is only of the intestines and of the stomach that he expresses himself a little better, saying, "neque intestina cum ventriculo reliquuntur immunia; sed ista observari inflammata, siderata et corrosa."

We will say nothing of Sauvages, who without ever alluding to the inflammatory cause of dropsy, assures us, however, that in those dead of this disease there are found "viscera plurima nunc hæc nunc illa obstructa, indurata vel etiam remollita, semiputrida, callosa, rettorida, granulosa, suppurata, absumpta, adaucta et sæpissimè hepar, dein lien, mesenterium, pancreas, uterus, rarius renes, epiploum, pulmones, Cor."

But what has always been to us a subject of the greatest wonder, is the attentive consideration of the great work of the so much venerated Morgagni, "De Causis et Sedibus Morborum," which includes, as in a treasury, all the principal and most interesting pathological observations registered in the preceding immense works of practical medicine and of pathological anatomy. How is it possible not to be astonished that *he*, who in the 38th Epistle—set apart for the examination of different dropsies, from the various dropsical cases which occurred in the practice of Vansalva and in his own, in each of which, both from the history of the symptoms and from the organic alterations occurring with the effusion, it is sufficiently clear that an inflammatory process preceded them and accompanied the effusion—does not mention one in which he recognises either the pathological alterations or the dropsy, as being generated by inflammation? And, in truth, it is very singular how this very celebrated anatomist, from the numerous observations which he delivers to us, in which at one time one viscus, at other times a different one, or one or other of the membranes were enlarged, or hardened, or cor-

rugated, or covered with purulent matter, or adherent to neighbouring parts, never speaks to us of the preceding inflammation, and still less as of a process producing the disease, and only sometimes treats of the inflammation at all of one or other of the viscera ; and, among the pathological observations which are mentioned, the collection of fluid is one in which he still more rarely recognises the preceding inflammation of the parts in which it occurs.

Thus it is not until the 20th Epistle, in which, (after having erroneously maintained that in the three cases of pneumonia registered under the Nos. 30, 32, 33, in which fluid was found in the chest, that it was independent of the visceral inflammation, and even had preceded it,) he says clearly, following Coiterus, that sometimes dropsy of the chest may be generated at the same time with pleurisy and pneumonia. But behold the beautiful explanation on the cause of dropsy which has been left us in this case by a writer on whom so many encomiums have been heaped. " Quod si huic inde, et sanguinis per pulmonum vascula circumitio retardetur, et humoris ex intima asperæ arteriæ, extimaque totius corporis superficie invisibiles quidem sed innumeræ jugiter prodeuntes particulæ cohibeantur ; hæ per alia aliarum membranarum foraminula exitum molientur, earumque præsertim, quæ magis tunc calentes, magis quoque patulos, habebunt poros, hoc est thoracem intus, ejusque viscera convestientium." But do not all the phenomena, visibly manifested in inflammation, shew something different from retardation of the circulation? and what afterwards shall we say of the explanation borrowed from the physi-

cal properties of inorganic bodies, that dilatation of the pores has reference to the high temperature of the part!

Finally, that which most deserves to be mentioned by us, in reference to this highly prized work, and which places beyond dispute our theory on the formation of dropsy, is, that of more than two hundred cases enregistered in it, of aqueous collections occurring either in the thoracic, abdominal, or cerebral cavities, all present at the same time either thickening of the membranes, or hardening, or tubercles, or ulcerations, or steatomatous concretions of the viscera, or, above all, adhesions of some viscus or membrane to the adjacent parts, either directly or through the medium of new fibres and false membrane: all alterations, the inflammatory origin of which, although even to these days so little known, is now maintained by the best modern physicians; thanks to the labours of Wrenholt, of Shroeder, of Frank, and especially of the Italians, Tommasini, Rasori, Rubini, Pisani, which will be demonstrated in the second part of this work. For this reason we do not think it necessary to stop long, in confuting the idea—which, however, is found in all medical books, and even of those nearest our own time—that these described visceral alterations are produced by the "stasis" of the water; on which point, moreover, to render the fluid fit for the purpose, it was necessary, from the time of the old physicians, to imagine, that it was impregnated with sulphur and salts, which, with their poignancy, rendered them more acrid, pungent, and corrosive; ideas,

the plain absurdity and ridicule of which, the ever-dominant humoral pathology did not permit to be exposed. But at present that this system has lost no little of its tyranny over the mind, we cannot believe that there is any physician of good sense, who (since in practice we see individuals who have been afflicted with dropsy during many months and years become cured, either by appropriate treatment, or even without any assistance from art), is not capable of making the obvious reflection, that if the stasis of the fluid was the occasion of the visceral alterations met with in this disease, how would it be possible to effect a cure and a return to good health, after so long a delay. Hence we cannot participate in the astonishment of Vanswieten, in reference to that lady, who, after three years of an immense ascites, Mead having extracted by puncture sixty pints of fluid, "nunquam rediit hydrops, et elapsis decem mensibus filium robustum perperit, plurium postea prolium fæcunda mater."

Nor in truth do we fear either the objections of any one who might pretend that sometimes the viscera in persons dead from dropsy are found healthy, and instead the lymphatic vessels turgid, or the authority on which this might be based. In the meantime behold the principal observation of Valsalva on this point, which Morgagni gives us as those on which he believed he had sustained the proposition.

"Fœmina viginti sex circiter annorum quæ uterum non semel tulerat, post animi perturbationes toto cor-

pore leviter, abdomine magis intumescit, difficulter et erecta respirat, neutrum in latus laboriose decumbit, ingens in thorace pondus percipit, maxime sitit, donec difficultate spirandi ingravescente, mortem obiit. In ventre pauca erat aqua, sed ventriculus præturgidus et hepar magnum adeo diaphragma sursum pellebant, ut thoracis cavea minor fieret. Ceterum lymphæ ductus turgebant in ventre, cunctaque hujus viscera bene se habebant, si indurata excipias ovaria, thorax omnino aquæ plenus. Pulmones non nihil duri, et rubri, variisque maculis nigris distincti, cætera sani."

And is it not sufficient to get rid of the most blind veneration for such great names, to discover that errors of observation are not altogether foreign to them. And, in fact, if any one can go so far as to say that all the viscera of the belly are healthy, after having stated that "Ventriculus perturgidus et hepar magnum adeo diaphragma sursum pellebant, ut thoracis cavea minor fieret," if it be asserted, as a trifling and inconclusive alteration of the lungs, when they were found "duri, rubri, variisque maculis, nigris distincti," what can we ever relate or believe to be true, or exact, or precise, grounded on their judgment of the healthy or morbid condition of the parts.

If, then, after the accurate examination of the post-mortem observations noted by the most illustrious writers on practical medicine and pathological anatomy—nor less of those which all physicians have a daily opportunity of making in the bodies of those

who die of dropsy—we gather, that almost always organic alterations are met with, in this or that viscus, which indisputably demonstrate that they have been preceded by a pathological process, inflammation, may we not faintly flatter ourselves that we have brought to light a very strong argument in favour of our theory of the inflammatory cause of dropsy ?

CHAPTER V.

Of the Method of Cure pursued in all times, although not always in accordance with the different Theories of the Schools.

By the attentive study of the best works on medicine, from the time of Hippocrates to our own days, it is easy to observe, that in the midst of so many erroneous ideas left us on the origin of Dropsy, in proportion to the different theories which, in various times, ruled the various medical schools, the method of cure resolved itself always into evacuation of the animal humours; to which were added, by some physicians, powerful means to increase the activity of those organic functions which maintain nutrition, and the necessary harmony of parts.

And physicians were doubtless led to the evacuation of the humours, from having all observed, as Vanswieten remarks, "naturam sæpius hanc viam indicare in sanando hoc morbo."

Hippocrates, in fact, had before observed:—

"Hydropicis secundum venas aqua in alvum prorumpente solutio fit (Coac. prænot. n. 467). Hydropi incipienti alvi profluvium aquosum superveniens citra

cruditatem morbum solvit (Coac. prænot. n. 457), subaquoso et lienoso, albaque pituita detento alvus vehementer, perturbata, bonum (De Morbis, lib. i. c. 4, et aphorism 29, sect. 7), which orders the dropsical patient, if naturally " non purgetur, medicamentum dehorsum purgans, quo aqua purgetur exhibito, (De Morbis, lib. ii. c. 28) ; and in another place, " si alvus sponte turbata non fuerit, cucaro dato, aut hippophæ, grano gnidio, vel magnesio lapide purgare oportet. (De Inter. Affect. c. 22.)

And here it must be remarked, that not only does he wish to evacuate the humours by the belly, but also by the cutaneous transpiration, since in the last place, whilst prescribing for the diet substances proper to excite the circulation, and increase the proper nutrition of parts, he orders, moreover, that the patient should walk twenty or thirty stadia per day: and the book, " De Vict. Ratione in Morbis Acutis," whether it be or be not by Hippocrates, clearly recognizes also the evacuation of blood as a means of cure in dropsy. " Quod si difficultate spirandi teneatur, anni tempus æstivum fuerit, ætas vigeat et virum robur adsit, sanguinem ex brachio detrahere convenit." Nor does he pass by the operation of paracentesis, saying—" Si igitur medicamentis et reliqua victus ratione juvetur et venter molietur ; sin minus, sectione facta, aquam educere oportet, (De Affect. sect. 1, 6.)

This method of cure by evacuation served as a rule to the Greek physicians, both ancient and modern, and even the best of these, Alexander Trallianus, is

seen manifestly to incline to, as well as to recognize, the inflammatory origin of dropsy, in the use of the evacuating treatment, saying openly, that "nullum valde calefaciens juvare potest, nam ejusmodi medicamenta situm ipsorum (hydrope detentorum) augent et febrem intendunt, et causas inflammantes, magis adhuc exurunt intenduntque malum." Hence he had no difficulty in ordering bloodletting; as was also the case with Paulus Ægineta.

Celsus, in his cure of dropsy, recommends evacuating remedies; above all of which, he praises the squill, and likewise lays much stress on exercise, frictions, and the hot bath, especially the sand bath, which, commended by all the physicians of the methodical sect, it must be seen cannot be of utility in many cases, except by the abundant perspiration which follows its employment.

But this work would swell into an immense volume if we were to report the method of cure which is found described in the great series of the works of the Greek, Latin, and Arabian physicians; nor do we think it convenient, inasmuch as any one, by the study of the same, can easily convince himself that the most active part of their treatment, all-complicated and contradictory as it was in this disease, not less than in many others, was always by evacuating the animal humours, by means of the use of emeto-cathartic remedies—diuretics and diaphoretics. In the same way, we shall say nothing of those physicians, who, at the resurrection of science, re-established the Greek physic, which, for this very reason, could not be diffe-

rent from the former ; and, in fact, the same is found in the cases of dropsy which we meet with here and there in the many hundred of practical observations collected and transmitted by the observers of the sixteenth century.

Also we shall say nothing of the chemical physicians, it being well known to all that their most powerful medicines were violent evacuants, which could not be otherwise, being preparations of antimony and mercury, of whose miraculous efficacy they boasted so much : and, in truth, although we are far from lending our faith to the vain-glorious Van Helmont, who says, " Se supra bis mille hydropicos, etiam quod lotium jam ex cruento inquiaret, et tota nocte vix unum cochleare minxerant, in pristinum sanitatem restituisse;" nevertheless, no one can assuredly deny that those physicians were very fortunate in their cure of dropsy, and had effected cures, surprising and miraculous, among other physicians : nor shall we occupy ourselves with the modern Iatro-chemists and Hippocratists, since from their theories, which we have before glanced at, we can easily understand how their curative method must have been to evacuate the animal humours. Such, in fact, was that of Willis, of Sennertus, of Piso, of Etmuller, and Riverius, and many others. In reference to this last, it may not be useless to observe, that of the fifteen or twenty cases of dropsy, related by him among his own observations, or those of others, there was not one in which, while it was impossible not to recognize clearly that the collection of fluid was the sequela of synocha, of puerperal disease, of acute or chronic inflammation, of

the spleen, liver, and lungs, &c., we do not see also in the formulæ of medicines, with which the patients were treated, a decidedly evacuating treatment, consisting of mild or drastic purgatives, diuretics, and diaphoretics.

But in reference to Sydenham, it is very well worthy of remark, that having maintained a defect in sanguification to be the cause of dropsy, and although the theory would lead him to a totally different practice, the first indication of cure laid down by him is the evacuation of the water, to effect which he makes the most courageous use of drastics, of emetics, and of diuretics; and still further, after having fulfilled the first indication, he lays it down for the second to give corroborants, nevertheless believing it to be necessary only with aged patients, or those "qui alios minus sani corporis habitu sunt præditi;" while young patients "aquis rite expurgatis, sine alio quovis præsidio convalescant." To which, if we add the reflection that in fact in all cases of dropsy reported by him no other treatment except by evacuation is reported, any one may easily deduce, even from the observations of this illustrious writer, the truth of the ideas which we are explaining, of the origin and cure of this disease.

In pursuing the subject, we have seen that a precursor of the theory and practice of Brown was certainly found in Ludwig, who having established the general debility or atony of vessels and of the whole animal machine as the primary cause of dropsy, decided that "vera medendi ratio ad sola roborantea ducit." But here we must observe that although this author, according

to his preconceived theoretical ideas, declares himself opposed to purgatives in the cure of this disease, he uses many other evacuants, sudorifics, and diuretics, among which he praises especially the squill, in which it appears to him, "invenire stimulum aliquem efficacissimum;" and in regard to the vital action of this medicine, it is singular to see how nature would almost per force convince him of his error, and reveal to him the opposite truth. "Tentavi quidem," he confesses, "scillæ connubium cum roborantibus et infuso corticis peruviani concentrato aliquam scillæ partem addidi; sed tentamina hæc semper inania fuerunt." But what avails, "when cæcutire volunt?"

Now see the explanation he gives of this: "Propteria quod robur solidorum nunquam nisi post evacuationes consuetas non nihil auctas instaurari potest," which is as much as to say, by way of removing debility it is necessary to debilitate the patient more by evacuations.

The same reflections we may repeat in reference to Milman and Vogel. The first of these, whilst in his explanation of the origin of dropsy, he attaches himself, as we saw, especially to debility, that is, "ad fibrarum laxitatem ad vires magnis evacuationibus, morbisve auctis in longum protractis, demissas"—to which he adds, "Impeditum revolubilem sanguinis circuitum"—nevertheless confides the cure principally to evacuants, and "quidem drastici," as the pills of Bacher, so much praised by him. Even in the observations of dropsies reported by him, while they demonstrate evidently the preceding and accom-

panying inflammation, the method of cure is seen to have been actively evacuant, since he did not omit even venesection, in spite of slipping in some exciting potion in the midst of these heroic purgatives. And Vogel—who preferred restricting the idea of atony as the cause of dropsy to the lymphatics, without giving himself the trouble to explain how the evacuative means which he suggests relieve the condition laid down by his theory (which he would have found not a little difficult), follows the physicians of all ages, "et ipsum naturæ ductum;" saying that "purgantibus imprimis ac diureticis, scorsim et conjunctim interpositis tonicis exequenda est."

Finally, also, the most powerful defender of atony, the graceful reformer of the theories of Hoffman, the celebrated Cullen, after having established these three curative indications on the theory of dropsy—

1. To obviate the remote causes of the disease;

2. To evacuate the accumulated serum;

3. To excite the energy of the system;—like all other physicians he lays the greatest stress upon the second, which he says he is satisfied of effecting by determining serous excretions, by means of which the absorption in the diseased parts is re-excited.

But to purge, to evacuate the humours by the stomach, the intestines, the kidneys, or the skin, was the principal curative indication of Quaun, De Haen, Storch, Borsieri, and, above all, of Casimir Medicus,

and Stoll, by whom the antiphlogistic method was courageously adopted, not even omitting venesection. When the great system of Brown appeared, according to whom dropsy ought to belong to the class of diseases of the asthenic diathesis, fanatics began to disclaim against the common antiphlogistic method, and employment of salts which produce evacuations.

CHAPTER VI.

Explanation of the Cause of Dropsy, taken from the preceding Chapters.

Reconsidering for the moment the materials derived from the preceding observations, it is quite clear that we have discovered five most important facts :—

1. That the collection of fluid constituting dropsy, in the different parts of the animal machine, is most similar, both by its sensible qualities, and from the principles detected in it by chemical analysis, to that which we see produced on the surface of the body, whenever certain forms of inflammation, produced either artificially or naturally, are developed there; and hence, that the collection of this last, whenever produced under the epidermis, may be considered as a true cutaneous dropsy.

2. That the fluid of dropsy is, on the contrary, wholly different in its component principles from the fluid which naturally exhales in the different cavities of the animal machine.

3. That among the productions of inflammation which attack the different parts of the body, dropsy is the most frequent, (principally speaking of erysipelatous inflammation), is demonstrated by the practical and anatomical observations of all the greatest writers of ancient and modern times, it having been seen always as at present that the anasarca, ascites, hydrothorax, and hydrocephalus, were generated by visceral inflammations; and above all by inflammations of the skin or membranes.

4. That in all patients who die from dropsy, from whatever remote cause it may be supposed to have proceeded, organic alterations are always found, irrefragably demonstrating a preceding inflammatory action.

5. That the principal method of cure, and the most successful, pursued in all times, was always to promote the secretion and evacuation of the animal humours; and, in some cases, at the same time to increase the activity of the functions of organs which maintain the necessary nutrition of parts: hence that from the exclusive use of stimulants, properly so called—wine, spirits bark, aromatics, no one has ever succeeded in curing dropsy.

Now adhering to the facts of the first class, we can establish first of all, that in order to constitute this disease, the dropsy, it is not necessary that the morbid collection of fluid should be formed in the cavities, or *quasi* cavities of the human body, as all the modern works, even the most recent, on medicine and

surgery, affirm ; that is, where naturally a certain vapour is developed, and perhaps condensed in part in the form of a little water, which is always being dissipated by means of the absorbents, and regenerated by the vascular extremities of the exhalent arteries. In fact, when the aqueous collections are formed, as we have seen, between the epidermis and the skin, can any one imagine a cavity between them in their natural state ? If, then, any part of the animal machine, hollow or not hollow, separating or not separating that natural humour, is susceptible of dropsy, the idea universally put forth, that dropsy consists in a merely exuberant collection of the humour naturally exhaling from the membranous surfaces of the internal parts of the body, begins to be esteemed false : an idea the erroneous nature of which is demonstrated to the plainest evidence by the facts appertaining to the second class. Instead of this, who does not see, both from the first and second reasons, that it must be admitted as incontestible, not only that dropsy depends on a collection of fluid, which did not exist before, or on a new morbid secretion, which the vessels of the surfaces of the part in which it commences, form, but also, that the morbid state which renders them capable of producing this dropsy is inflammation. And in truth, from these two classes alone of facts, we might with sufficient reason have established the truth of the theory of the formation of dropsy ; but we wished to have other arguments, and we have found them in the examination of the three other classes of facts which occupied our preceding investigations : the last of which will suffice to establish also the true theory of the cure,

and consequently the curative indication, which includes all the facts contained in the history of medicine, confirmed by the practice of other physicians.

Hence in reference to the production of this disease, each will see not only demonstrated our theory of the universally inflammatory cause of dropsy, but that all other causes remain excluded, because contradicted by one or other of these classes of facts.

And this last consequence we should altogether abandon to the perspicuity of our readers, as we do all the theories anterior to those of the Scotch physician, Dr. Brown, if the too notorious opinion of this reformer, and its modifications in the present day, did not oblige us absolutely to occupy ourselves with the consideration of it.

CHAPTER VIII*.

On the false opinions commonly put forward, from errors of observation on the remote causes of Dropsy.

Do, then, the dropsies commonly believed to succeed to debilitating causes, depend on inflammation?

Here let us be permitted to institute an impartial and candid examination of those causes, called occasional or predisposing, which hitherto all physicians have entertained.

First behold that of Boerhaave, which it will be quite sufficient to mention here, because it may be seen copied in all other books of theory and practice of medicine.

"Dispositio gentilitia: potus nimius frigidè sumtus neque vomitu, neque alvo, neque sudore vel urina, calore, motuve excitatis excretus: morbi acuti, in primis ardentissimi, sive cum site potuque inexplebili sive sine his: dysenteria lienosa, diu permaneus: omnes pertinaces viscerum obstructiones, ut scirrhi hepatis, lienis, pancreatis, mesenterii, renum, uteri,

* The Seventh Chapter is omitted, as consisting entirely of arguments against the Brunonian theory.

intestinorum: icterus: quartana sæva et podagra: evacuationes quæcunque nimiæ, maximè sanguinis arteriosi: haustus acrium, fermentatorumque liquorum: victum tenacium, durorum: hydatides ingentes, plures in cavo abdominis pendulæ, et plura similia ut melancholia, scorbutus."

Who does not see us borne out in what we asserted in another place, that all physicians had held, as causes of dropsy, only those effects which accompany it, and of causes also which neither dispose to, nor occasion it, but can alone be the occasional and predisposing causes of the first pathological process which generates it.

And respecting the hereditary disposition to this disease, (which we might think complimentary to Boerhaave to enumerate as a remote cause, although indeed it received but very little support from his accurate commentator Vanswieten, in bringing forward the superstitious custom of which Plutarch speaks, regarding the sons of persons dead of dropsy bathing their feet in the water of the ascites, at the burning of the corpse, under the idea of protecting themselves against the disease), it must be remembered that even were it established by decisive observations, it presents no obstacle to our doctrine: for on this subject the same observation may be made on dropsy as on phthisis, which is, that as such an organic disposition of the viscera may be inherited as to render the patient more easily attacked by inflammation, so this inflammation may be disposed to produce dropsy rather than any

other consequence of inflammation; otherwise it is altogether erroneous, and not conformable with accurate reasoning, to say that dropsy recognises hereditary disposition as an occasional or remote cause.

Frank, moreover, does not much believe in this hereditary predisposition, but proposes instead, sex, age, and certain employments, as occasional causes:—saying, "Attentionem meretur in hydropem dispositio sexus fœminei, fœtus in utero, ætatis infantilis, senilis, hominum litteratorum, artificium vitam sedentariam agentium."

And here, indeed, although it is evident that there is no other foundation for this than as it were arises from the inheritance of the Boerhaavian and Cullenian philosophy, we may make an observation similar to that on the hereditary disposition, viz. that in one or other sex, at one or other age, there may be a disposition to receive an inflammatory action more disposed to end in dropsy than any other of its terminations; since, in fact, when women and young children are attacked by inflammation, it is for the most part of the erysipelatous kind; but never can it be said rigorously, that sex and age are predisposing causes of dropsy, as also by no means are certain occupations. And it was only to sustain some humoral, dynamic, or chemical theory, that it was asserted, that stone-cutters, tailors, shoemakers, weavers, stove-makers, fishermen, and washer-women, were more subject to the disease than others. And although Ramassini says of millers:—"Non paucos asthmaticos factos, ac tandem in hydropem lapsos observavi," it is

quite clear that neither the flour nor the powder, to which he attributes it, can give occasion to the disease, except by giving origin to inflammation of the viscera of the chest: nor does it produce a greater difficulty, the asserting, with Zacchia, that gardeners are subject to dropsy, when it is impossible not to see, in their habits and the nature of their labour, an abundant source of causes occasioning slow inflammation of the viscera of the abdomen and the chest.

In reference to infancy, it is unnecessary to notice how much the dropsy in the fœtus depends on inflammation; it being well known how much it is exposed to suffer from injuries or wounds inflicted on the mother.

On cold drink we agree entirely with the excellent observation made by Frank, when he says:—"Morbos alios quidem, sed minimè hydropem nisi secundarium ex illis oriri videmus;" and when it occurs it probably depends on enteritis or some other visceral inflammation, which practitioners have often seen succeed to copious draughts of cold fluids, "post æstum majorem."

We shall say nothing here of acute diseases, inflammatory fevers, visceral membranous inflammations, and the exanthemata, as causes of dropsy, having had our attention occupied with these diseases in another place. Instead of this, it will not be altogether useless to consider a little the dysentery, because many have believed that, in the progress of this disease and in other profluvia, they have found a most serious

objection to our opinions on the cause and formation of dropsy.

And here we must first observe, that Frank, in his much lauded observations on dysentery, shews that he really understood the nature of the disease, since he describes evidently, inflammation of the intestines. But he would not undoubtedly have injured the result of his labours, if he had avoided modelling them on the abstract classification of Brown, and if he had not mingled with inflammation a theory imaginary in itself, and repugnant to the doctrine of inflammation—the asthenic diathesis; and had he not done so, he would have undoubtedly acknowledged that when dysentery is supposed to have passed into such a condition, nothing has occurred otherwise than the establishment of organic disease produced by inflammation.

Let us pass over his other error in believing "effectus dysenteriæ frequens, inflammatio diversæ indolis, intestini recti, aut coli erysipelacea, interdum profundior est;" while in fact, instead of the morbid secretion, and the mucous evacuations of the intestines, which were called dysentery, these are in fact the consequence of inflammation of the intestines, produced either by miasmata, or some other external cause. Hence there is nothing wonderful in the spreading of this inflammation even to the external surface of the intestines, or, in very severe cases, to the whole of the abdominal and even the thoracic viscera, as may be collected from the observations of Dr. Pisani, in his excellent work on the Epidemic

Dysentery which existed in the Military Hospital of Mantua, in the years 1811 and 1812.

We shall say nothing here on visceral obstructions as causes of dropsy, because we have already pointed out that we shall prove in their proper place that these are simply the effects of inflammation, in the same manner as all other organic degenerations are. Hence we may maintain, that when they are found with dropsy, they are only the effect of one original pathological process, and that they accompany dropsy, but are not the causes of it: and the same may be said of jaundice, which every body knows to be most generally one of the symptoms of either acute or chronic hepatitis.

And in speaking of these organic alterations, supposed to be the causes of dropsy, it will be as well, lest any should hope to oppose our doctrine in reference to the diseases of the heart, from which may be inferred the impediment to the free course of the blood as a cause of dropsy, and hence an objection to the universality of our doctrine of inflammation, to acknowledge before hand, that we shall demonstrate all these alterations to proceed from inflammation attacking the heart and great vessels, which either renders their structure so soft that dilatation succeeds, or, on the contrary, thickening and hardening the parietes; or causes the effusion of coagulated lymph, which produces the adhesions, the fringes, or the concretions called polypi, so variously described by authors on pathological anatomy: hence nothing will be more obvious than that inflammation attacking also the

pleura, the mediastinum, and the pericardium, should give origin to the dropsy which accompanies these affections.

And it is easy here to resolve the question proposed by Frank, speaking of the sudden starting, with pain and agitation, which accompanies hydrothorax, and which he recognises as a symptom of many diseases of the heart—whether this ought to be considered as a cause, or rather an effect of dropsy, when observed at the same time with it: we answer, that neither is this an effect of such diseases, nor those diseases resulting from it, but both the disease and the symptom owe their origin to one and the same cause.

But in reference to the discharges of blood, which our adversaries consider as victorious arguments against our opinion, what would they have? Hildanus cites a case of a dropsical patient, in whom epistaxis occurred, and who lost four pints of blood:—"Non tantum vires redierunt, verum etiam ab hydrope citra ullorum aliorum remediorum usum brevi curatus est æger." Besides, how happened it that the soldier, in whom the thyroid artery was wounded, (and was saved by my excellent friend Palizzini, by means of large bleedings), did not become enormously dropsical? and in the case of the other soldier, reported in Brugnatelli's Journal, who, after a wound of the carotid artery, lost twenty-five pints of blood, imagine what happened,—a sudden and extreme wasting of the body; that is to say, an extreme increase in the inhalent vigour of the absorbents, or in other words, a condition exactly opposed to that which permits the

formation of dropsy. And are there any physicians who have not seen patients labouring under aneurism have their lives protracted during no short space of time, by bleeding, repeated often during the month, without any dropsy supervening; and if such dropsy should have succeeded, will they deny that, on the post-mortem investigation, undoubted traces of inflammation, either of the thorax or abdomen, were visible? And if this be true, are we not authorized to consider simply loss of blood, as a cause of dropsy, to be altogether hypothetical, and even impossible. But our opponents will say, do we not see dropsy every day succeed acute diseases treated by large bleeding? Yes, certainly, and also after uterine hæmorrhage, from protracted or difficult labour, after hæmoptyses, &c. But when dropsy succeeds after bleedings in inflammatory fevers, or visceral inflammation, what physician is so dull or short-sighted, as not to conclude, as we have otherwise observed, that the dropsy supervened, not in consequence of the evacuation of blood, but because it was ordered late, and was insufficient to stop the inflammatory condition?

And in the acknowledged cases of hæmorrhage, after which we allow that dropsy is developed, who can deny that an inflammatory condition in this or that part may be discovered by an attentive physician? And does not this occur because inflammation is going on in these cases of hæmorrhage, to which dropsy succeeds; while the latter disease never occurs after vast losses of blood occurring suddenly, or naturally from external causes? And finally, who does not perceive in this an answer to the very just

question of Lister, who, when relating the case of a lady attacked by dropsy after a severe cough and hæmoptysis, and who had been freely bled five times—which dropsy he attributed, according to the received opinion of physicians, to the loss of blood—wonders much how it happens that dropsy scarcely ever succeeds to natural loss of blood, however copious, from the uterus, from hæmorrhoids, from the nostrils, or from wounds in any part of the body, but on the contrary, often follows losses of blood which occur in the progress of disease ?

But in reference to the abuse of spirituous liquors, facts obliged all physicians to admit it as a remote cause of dropsy, although in truth it embarrassed not a little the theory of Sydenham, and Morton, and Lister, and Cullen, and also other writers. But on the appearance of Brown's doctrine, every one thought they had dispersed all clouds, and with the game of imaginary, direct asthenia, easily understand how dropsy might be produced by substances essentially stimulating, and hence become indirectly asthenic, in a disease esteemed on first principles directly sthenic. And that dropsy is often of this type, even the celebrated P. Frank does not hesitate to affirm, to explain how " bibacissimi quique helluones sæpius ex hydrope, quam cæteri mortales conflictantur." But we, who maintain with the last and best reformers of the doctrine of excitability, that stimuli can never directly induce a weakness of motion, or in their sense asthenia, at least as long as the part retains its organization—we really believe that we are not wandering from the truth, in believing that the abuse of

spirits is not the immediate cause of dropsy, even sthenic, because we have seen that the diatheses of Brown and others are two abstract conditions, inapplicable and contradictory to the facts to explain which they are applied: but that truly it occasions the slow abdominal inflammation with which all hard drinkers are at length attacked, and that these inflammations produce the watery collection which constitutes dropsy.

Finally, no one will oppose the dropsy which succeeds intermittent fevers as an obstacle to our theory of its formation; for in this respect the first practitioners will agree with us in admitting, that most frequently some slow and occult inflammation is progressing in one or other viscus, under the appearance of a rebellious and obstinate intermittent, demonstrated by the solid swellings which often arise, and which many have attributed to the bark; which is true, but only in this sense that the use of the bark fostered (as in one way was the opinion of Baglivi) that inflammatory process which produces the degeneration of the organ, erroneously called solid swelling or obstructions. It is not either the ague or the solid swelling which produces the dropsy, but only the primitive pathological process, inflammation, working with the ague in one or other part, and being increased by the administration of the bark, which generates both the dropsy and the before-mentioned visceral changes. Hence let us conclude with the celebrated Giannini, "that a physician could never live free from remorse, whose patients in tertian ague, treated with bark, die or become dropsical."

Lastly, in reference to hydatids, which are enumerated by physicians amid the causes of dropsy, we must reflect that if these are animals they have nothing to do with dropsy, and even when collected together into a mass, they form a morbid abdominal swelling, undoubtedly this cannot be considered as an ascites. If they are not animals, as we believe with Frank, it may be maintained that these vesicles are so many dropsical cysts, but not that they can ever be the cause of true dropsy. And on their production, who does not see that he is not wandering from the truth, when he thinks that they also, in the same way as other cysts, owe to inflammation the process of their formation; and that the variety of their structure, and of the substance contained in them, whether it be serous, or albuminous, or ichorous, or the consistence of honey, or similar to adipocire, only arises from the different nature and severity of the inflammation, and its causes, and from the various organization of the parts in which they are formed?

CHAPTER IX.

Examination of the thirst and wasting which accompany Dropsy.

Two symptoms which the most frequently accompany dropsy, are thirst and wasting of the body; hence in treating of this disease it is impossible to avoid investigating their causes, the more because the question concerning the thirst, which is in fact very obscure, has not been decided either by physiologists or pathologists.

Commencing always with the method hitherto scrupulously observed in our practical and pathological researches, and which appears to us most conformable to the dictates of Bacon, we shall first examine all the facts most important in throwing light on that pathological condition in which living beings are often found, and which being perceived by the animal, is called thirst. Now, of these facts, some lead to the final cause, others to the discovery of the physical cause, or the organic condition in which it consists.

Among these are the profluvia of the various animal fluids, during which either a greater or less degree of

thirst occurs. Of these especially, the diabetes, (of which Frank well said, that it was " vera corporis per urinam colliquatio)," presents in a terrible manner, in a greater degree than any other disease, the symptom of thirst. " Prima (says this great author) quæ in diabeticis quos vidimus occurrebant, et ex improviso plerumque hominem prehendebant, symptomata, oris scicitas subitanea, ac sitis vix poculo a labiis remoto recurrens, nec verbis describenda fuerunt."

Diarrhœa, principally of the serous kind, which is often excessive, is another among the profluvia which is accompanied by great thirst.

The same may be said of ephidrosis, and more or less of all copious discharges of the animal humours, especially the aqueous ones.

Besides the profluvia, other morbid states present thirst as a symptom to our consideration, and these are all those in which the animal machine has its organic movements increased, in consequence of which some or other of the secretions or excretions are increased, or increase of heat is developed, which destroys a proportionate quantity of fluid material.

Now from all these morbid states a fact may be deduced, that in these there is produced a want of fluid or of aqueous matter.

But we have seen before, that in all these conditions the animal receives the impression, more or less, of

an uncomfortable feeling called thirst, to remove which it seeks to introduce fluid into the body.

Now as with this it is effectually removed, hence it follows as a consequence that thirst in animals is a certain condition of their machine caused in an unknown manner by want of fluid, and which is perceived by them as painful, and which feeling is intended to warn the individual of the want of fluid; whence meeting with it, it may restore the health (or integrity) of the machine. Hitherto, then, we have spoken of the final cause.

Now if we would approach near to the discovery of the physical cause, we must shew in what it consists, from facts, and to what primitive system of organs that condition, undoubtedly material, appertains, which, when perceived by the mind, is called thirst. And to this knowledge it is not improbable we may arrive, but never can we hope to attain to the knowledge of the means through which this condition is always the consequence of deficiency of fluid. The facts, moreover, in which it appears to us we may discover the material cause of thirst, reduce themselves to one—the extreme activity of absorption which the inhalent extremities of vessels of the different surfaces appear to acquire, when animals are in want of fluid, in consequence of profuse discharges, or from long abstinence from drink, and which state is expressed by the word thirst, demonstrated by the greediness with which fluid is sucked up by the lips and fauces in these morbid states, and which is also seen to occur over the whole surface of the body, par-

ticularly in profuse diarrhœas, or in diabetes, to such a degree, that this disease was in fact attributed by some to the extraordinary cutaneous absorption of humidity from a damp state of the atmosphere. Also it is well known that in long voyages by sea, in case of want of water, the sailors try to quench the terrible sensation of thirst by covering the surface of their bodies with linen soaked in the sea. After this, who will say that we wander from the truth, maintaining that the material condition of thirst exists, in fact, in this organic and dynamic condition either of a part or the whole of the absorbent system; that is, in increased activity respectively of the action of that part or whole. But some will argue that if thirst consists in this vascular condition which is the immediate consequence of want of fluid in the circulating system, how does it happen that patients are often manifestly in want of fluid, and yet do not complain of thirst. "Iis," we answer with Hippocrates, "mens ægrotat."

And in fact it is necessary on this point to reflect, and it may throw no small degree of light on different facts in the animal economy, both sane and morbid, that although the material condition of thirst just mentioned may be present, it is not necessarily a consequence that it should be perceived by the animal. How often on waking in the morning we feel suddenly tormented by great thirst. Who can suppose that the material condition of this thirst begins immediately and at the very moment of waking? No one in his senses. This existed undoubtedly during sleep, although the individual was not conscious of it. And

in this way there is no obstacle to affirming that thirst is an organic and dynamic condition, which not only all animals experience, but also all organized beings; since an infinite variety of facts in the vegetable economy, both healthy and morbid, shews clearly that the individuals of this class suffer also, in similar cases, with animals, and most probably there exists in them a similar condition of a similar system.

But to resume: if in all the above-mentioned morbid states which thirst accompanies, whether perceived or not, it is always the consequence of deficiency of fluid in the circulating system, why must not the same exist when dropsy accompanies it? And certainly, notwithstanding the many wonderful circumstances which might induce a contrary opinion, dropsy is a disease, as the ancients considered, arising from superabundant "colluvies serosa." For how is it possible that so extensive a source of secretion and excretion, into which the immense membranous surfaces of the abdomen and of the thorax, (when dropsy arises there), are changed in consequence of inflammation, should not impoverish the circulating system?

But how does it happen, here we hear it objected, that if in dropsy there is thirst, and that the material condition of thirst is an activity of the lymphatic system, the disease does not disappear of itself? And this happens in fact every time that it is not kept up by an actual inflammatory state of parts, or accompanied by other organic alterations, and the lymphatics have not suffered from the compression exer-

cised on them by the long stagnation of the fluid: and in fact, in practice, cases of dropsy separated from all these pathological conditions must be rare; and also it is very natural to believe, that in dropsies of some standing, even though the inflammatory state of the parts in which they arose has disappeared, the absorbing extremities of the lymphatics of the parts must have lost their activity: hence the reason for the necessity, in the cure of dropsy, of bringing the lymphatic system into this state of thirst; and if, indeed, any of the divisions of that system, not exposed to one or other of the before-mentioned disabling causes, have suffered no alteration, in them it must be increased, in order that by extending it even to those lymphatics through which the absorption of the fluid morbidly collected ought to be effected, their inhalent power may be rendered more active.

Now the primitive organic action of the increase in the activity of the absorbents, which we have discovered, in every case of want of fluid, to be the material condition of thirst, gives us in another manner the reason of the wasting, whatever may be the form of the disease which it accompanies, and hence of that wasting which accompanies dropsy.

For by demonstrating that all the circumstances appertaining to this wasting (whatever may be the primary or secondary morbid process which it accompanies) prove that its very existence supposes an impoverished state in the nutritious matter in the circulating system, and a defect in assimilation, and

the matter itself, which first rendered parts properly firm and nourished, certainly not vanishing, as we have proved in another place, except by increased activity in absorption, it is a consequence that this condition of this system of vessels exists in all cases of wasting; and that it is dependent on a hidden relation between these vessels and the want of nutritious matter in the circulating system, analogous to what has been proved to exist between the same vessels and the want of fluid in the body. Every time, then, that the general circulating system, to which is owing the healthy action of organic life, is deficient in fluid matter, the lymphatics will take on that material condition, thirst, which might be said, in nearly the sense of Stahl, but really as a property of organized matter, to be, an appetite for fluid; and every time that the same circulating system is in want of that substance from which it receives stimulus and materials for the entire preservation of the healthy actions of the animal machine, one or other of the divisions of the lymphatic system will take on a state of increased activity, probably similar to the one already described, and which may, in a similar manner, be denominated *appetite for nutriment*.

And who knows that this condition of the lymphatics may not be one of the material conditions of hunger? Nor, on the contrary, will it hold good to observe, that very often, where there is wasting, the patients do not complain of hunger, and eat little; since we have seen that the material condition of thirst may exist, without the animal being aware of it.

We must here, however, warn our readers, that we are inclined to believe that there is a difference between that organic condition of beings, commonly called hunger, and the state of the lymphatics, which is the cause of the wasting in all cases in which the circulating system is in want of nutriment. Perhaps the greatest number of the causes which give rise to hunger exist in the stomach; but we think it not improbable that one arises from the before-mentioned state of a part or the whole of the lymphatic system.

But from among the facts which plainly demonstrate that the appetite, or hunger, of the whole system of the absorbents, or of some of its divisions, occasioned by the want in which the animal machine finds itself of nutriment, is the proximate cause of wasting, besides those before enumerated, the following places it beyond contradiction:—Those who catch marmots and dormice, assert that these animals are fat and well nourished before they retire to their holes, and very thin and hungry when they wake from their long lethargy and quit their retreat. Now it is incontestible that these animals, even during their long sleep, must be in want of nourishment, because the organic functions are supported, however weakened they may have become. But they do not take in any nutriment from without, and must be supplied by that substance which envelopes parts in a greater quantity than is essential; but this cannot be removed and transported into the great circulating system, except by means of the absorbents; therefore an extraordinary activity in these vessels will be the sole proximate cause of the leanness of parts.

It is, moreover, the extraordinary activity in the absorbent system, which is the nearest proximate cause of the defect of either fluid or nutritious matter in the general circulating system: but there will be, between one and the other, links of a chain unknown to us—facts which bind them together more strictly; since in truth we cannot yet see, between the one and the other, that necessary relation which ought to exist, before it can be maintained that one must be the effect of the other. Now, every time that, in physiological and pathological researches, we are in a similar difficulty, no little light is obtained from the investigation of final causes, very improperly despised and neglected by the modern observers of nature.

It is precisely when we arrive at this point that we give the name of laws to these ultimate (for us primitive) facts. Hence, in the present instance, we consider it to be *an established law or property of the lymphatic vessels in animals, and of those vessels which supply their place in vegetables, to increase the activity of their functions every time that the great circulating system, the generator and repairer of organic matter necessary to the harmonious performance of the circle of action, which constitutes life, is in want of materials either aqueous or nutritious.*

Hence it is to this same law of the lymphatic system that is owing (besides the thirst) the wasting in dropsy, as in other diseases which it accompanies; while we have also in the same, the more than sufficient cause of that which we have seen to be most

necessary for the production of the wasting—a deficiency of nourishment in the circulating system.

Who does not see the largest source of the loss of nutritious matter, and the consequent impoverishment of the general system, in the profuse secretion and effusion of the fluid which constitutes dropsy, exuding from the extensive surface of the inflamed membranes? And in this sense most true is the idea, which the ancients, especially Aretæus, distinctly entertained of the analogy between this disease and diabetes: for in truth there is, no less in dropsy than in diabetes, a morbid secretion and effusion of nutritious matter, demonstrating at the same time the resemblance of some of the characteristic symptoms of the two diseases; as the sweet taste, &c. And we have already shewn, that the excessive secretion called diabetes, like that of all the other humours, is no other than one of the symptoms of inflammation of the part from which it flows, or of another state less acute, which we have called "Nisus phologisticus."

CHAPTER X.

Explanation of the cure of Dropsy, derived from the reasoning in the preceding Chapter: reflections on that proposed by Cullen, by Milman, by Darwin, by Rasori: and examination of the "modus operandi" of remedies to promote it.

It is, above all, the law of the lymphatic system, declared in the preceding Chapter, which relates to its increased activity during a deficiency of aqueous or nutritious matter in the circulating system, (whilst at least its organization is entire), which, whilst it furnishes us with the most plausible explanation of many obscure points in pathology, regarding certain metastases, affords, above all, a satisfactory one of all the facts of the cure of dropsy, whether natural, or effected by medical aid.

For having demonstrated that a dropsical patient is never cured without the excretion of some of the animal humours being rendered more active, either naturally or artificially—and having first demonstrated so many facts to prove that, under the same circum-

stances, the lymphatic system acquires activity in its absorbent power, which, in the greatest number of cases, is perceived by the mind—at the same time the deduction is not more rigorous than that the disappearance of the aqueous collection constituting dropsy, not being able to be effected except by means of the absorbent vessels, is directly owing to the increase of their energy in proportion to the impoverished state of the fluid in the circulating system, which proceeds from the copious secretion and evacuation of some animal humour, produced either naturally or artificially by means which increase secretion and excretion.

And observe that this theory of the cure of dropsy, founded on our explanation of thirst, gives also a convenient reason for the cure of this disease by the *dry method*, although the two would appear to be opposed to each other. For the greatest cause of the lymphatic thirst, ought it not to be abstinence as much as possible from drink, and the promoting as much as possible cutaneous exhalation by sweat? Hence is it not easy to comprehend the disappearance of the fluid morbidly collected, in every case in which its origin, inflammation, has been previously dissipated?

Hence, therefore, our theory of the cure of dropsy is not less unshaken and exclusive of all others, than that already established of its production, since it explains all the facts which the history of medicine and daily experience shew to relate to it, while every other theory is repugnant to one or other series of facts, the truth of which the authors of such theories seek

to deny. And in reference to those facts first related, regarding the cure of some dropsies by means of exercise and abstinence from liquids, being of all others the most embarrassing to the theories of the causes and cure of dropsy usually proposed, these authors refuse flatly to admit them: as, among others, is the case with Milman and Darwin.

But was it not doubtless from having seen the good effects, that Hippocrates advised the dropsical patient "edat sicca et acria, et quam minimum bibat, et quam plurimum laboret?" and is it not of still more weight, since it is not deduced from, or brought forward in support of, any theory. Celsus says the same, when he expresses himself thus:—"Potio non ultra danda est, quam ut vitam sustineat;" to which he adds, that "multum ambulandum, currendum est," and still more, "evacuandus est sudor non exercitatione tantummodo sed etiam in arena calida." Galen, moreover, attests to have seen some dropsical patients who were cured by abstaining from drink for fifteen days: and passing over what Pliny writes of a certain Roman knight, Julius, who abstained through the decline of his life almost from drinking, and thus was cured of a dropsy, Bennivenius assures us that a countryman was cured of a dropsy by abstaining from drink during an entire year.

But here it is necessary to observe, that we agree with Milman in discrediting this method of treatment, thinking that it rarely can have a favourable result; and the reason is this,—that in practice the cases of dropsy are rare in which the source of the inflammatory process

which produced them does not still exist; in which case not only is it necessary, as we shall see, to excite the lymphatic thirst, because it promotes the absorption of the fluid already collected, but first of all it is necessary to deprive the dropsy of its source, by overcoming the inflammation which produces it.

But it will be said, what novelty is there in this theory of the cure of dropsy, since Cullen has already stated, that the cure is to be obtained by the evacuation of the accumulated serum, by producing certain serous excretions, by which means the activity of the absorbents of the diseased parts may be excited? But here we must observe, that though the author has stated the truth which we have been demonstrating, yet as it included a fact altogether hypothetical, because hidden from our senses, it might with equal reason be denied. Nor, indeed, has Cullen shewn any more knowledge on the subject than was possessed by the ancients; for they also well knew that the morbid collection of fluid diminished, and even disappeared, by reason of abundant serous excretions: hence, imitating nature, they sought for the proper means to promote them, and the favourable result sanctioned, in all times, the powerful effects of evacuants in subduing dropsy. Thus Willis, in explaining the manner in which purgatives cure this disease, after having stated that a cathartic "arteriarum oscula versus intestinorum cavitates dehiscentia irritat, ut per hæc potius emissaria humor e sanguine rejectus exitum inveniat," adds plainly, that "vasa inanita aquam mox intercutim resorbent et partim illico per sedem, partimque per urinas aut diaphoresi,

foras amandant." But what immediate and strict relation was there ever between the fact of the humoral evacuation, and the other assumed fact of the increased activity of the lymphatics of the internal cavities, that the last must be the immediate and necessary consequence of the first? for the very principle of debility or atony of the general system, and particularly of the lymphatics, maintained by Cullen as the principal cause of dropsy, through the defective condition of the absorbents, was incompatible with the assumed action, since a deficiency in the power of the absorbents, through weakness or atony, ought to become increased in consequence of a debilitating cause, such as the evacuation of the animal fluids.

We may repeat the same reflections on the explanation of the cure of dropsy left us by Milman, who says, "eam in corpore animali obtinere legem, qua si medicamentorum ope magna aliqua evacuatio ex quavis parte provocetur, fit ut fluida quæ aliis in partibus latent, resorpta, ad organa remediis sollicitata deferantur et eliminentur. Hinc humores hydropicorum alibi in cavis hærentes ad intestina remediis purgantibus, vel ad renes diureticis devecti, foras protrudentur." But as these last ideas, in part similar to those of Willis, with the addition of the hypothesis of the retrograde motion of the lymphatics, form the whole of the attractive machinery of the theory of Darwin on the cure of dropsy, (although both Willis and Milman and Darwin set off from the erroneous supposition, that the fluids evacuated by purgative remedies employed in dropsies are the same as those morbidly collected in the different cavities constitut-

ing the disease), so the objections which we are about to bring forward against this last theory will be valid against the others.

Darwin, after having maintained that the immediate cause of dropsy exists in the palsy of some of the branches of the absorbent system, called lymphatics, and which open upon the surfaces of the larger cavities of the body, and in the cells of the cellular structure, in which a well-known fluid is secreted for the purpose of lubricating the surfaces, explains the cure of it, by means of drastics and purgatives, by supposing that these substances produce, on the internal surface of the alimentary canal, an inverse motion propagated to the lacteal and lymphatic vessels, by means of which, continued even to their open extremities in the different cavities, they promote in these vessels both a flow of lymph contrary to the natural direction, and at the same time an increased activity in the absorbent action of their extremities. Now, in this theory, the celebrated Darwin has advanced nothing new except an hypothesis contrary to the experiments and established observations of anatomists, which is, that the lymphatics invert their action, in order to explain the transport of the fluid of dropsy from the part in which it was collected to the intestines; a fact already awkwardly assumed by Milman, and pretty clearly stated by him.

Now, omitting all the valid anatomical and physiological reasons of Professor Jacopi, against this imaginary transport of fluid without its passing through the circulation, and his own reasons, still more deci-

sive, against the possibility of the lymphatics taking on the desired inverse action—and omitting no less our own opinions mentioned in the first part of this work, in opposition to all the laws of the excitability of Darwin, and particularly of that torpor, which, in this place, he makes the principal cause of his imaginary condition of the lacteals and other lymphatics—we must observe, that in order to maintain that the fluid evacuated from the intestines, in dropsy, by means of drastic purgatives, proceeds immediately from the cavities where it was morbidly collected, it will be necessary to prove, first, the identity of the principles composing it; secondly, to shew that the same medicines, if administered in a state of health, or in any case in which a morbid collection of fluid does not exist, do not produce the same evacuations from the intestines—which is precisely contrary to the fact.

But in reference to these hypotheses; first, the torpor of the extremities of the lymphatics excited by these remedies: secondly, the retrograde motion in these vessels, consequent on their application, the most singular and strange action, and the reality of which must be most necessary to the theory; and lastly, the third, which is put forth as a consequence of the other two, viz. the increased activity in the mouths of the absorbents, which open in the different cavities where the morbid collection of fluid is found.

And in truth, if by laying aside the anatomy of the structure of the lymphatics, and the experiments relative to it, we could conceive an inverse movement

in them possible, it would be a matter of indifference to concede its existence : but it must be impossible for any one in his senses to believe how such a motion can increase absorption ; and being changed into an opposite one, not only is the action not disturbed, but even rendered more active and increased in force. Hence something more is wanted than mere dreams, in order to make us renounce the common opinion, supported by all the facts relative to the different humoral secretions, rather than the idea that the evacuations from the intestines, under the administration of drastic purgatives, are merely the effect of activity in the secreting action of organs produced by these substances, and precisely similar to the increase of the saliva or of tears, after the application of acrid substances to the mouth or the eye.

But coming to the great Italian, the translator of Darwin, the celebrated Rasori, we must observe, that in his note to the 200th page of the Zoonomia, having shewn that he believes with Darwin that the urinary and intestinal evacuation in dropsies treated with the digitalis, with drastics and emetics, depend on the retrograde action of the lymphatics, in that to the 224th page of the same volume, he is opposed to this theory, saying, that drastics and emetics do not cure the dropsy by producing increased absorbent action in the lymphatics of one part or another, but by destroying the sthenic diathesis of which the disease is constituted, the evacuation of the fluid being a secondary action.

Now in these two notes, if it is not wished to blame

the author for a manifest contradiction, it becomes necessary to infer that he maintained dropsies to be cured by these remedies by the removal of the sthenic diathesis ; and besides this, by bringing in the retrograde motion of the lymphatics, through which the evacuation of the water follows, without its passing through the circulating system. And here we must remember, that one of Rasori's first disciples, to whom, as our master, we owe the most distinguished respect and gratitude, teaching that drastics act by contra-stimulus, and recommending them in dropsies termed sthenic, explained the cure not only by an imaginary primitive *vital* action, but in addition, he attributed the evacuations following their administration to the retrograde action of the lymphatics induced by them. Thus, (returning to Rasori) the evacuation of the water in dropsy treated by drastic purgatives, is, in his opinion, a secondary effect; that is, to the destruction of the sthenic diathesis which obstructed absorption, and also to the retrograde movement induced by them.

Now to say that these remedies destroy the sthenic diathesis of the lymphatic system, is the same as to say that they restore it to a natural condition; hence this inverse movement will be a natural and healthy condition.

Who among the partizans of the contra-stimulant doctrine, being convinced by the incontrovertible arguments taken from anatomy, physiology, pathology, and logic, must have rejected this imaginary condition of the lymphatics, how can any one of these ex-

plain that, by the simple removal of that sthenic diathesis of the whole body, which we have demonstrated to be hypothetical, and otherwise repugnant to the truth, the before-mentioned remedies can bring on the sudden and often surprising cure of dropsy, which not unfrequently we have seen to be the effect of their administration? In fact, if these substances, by means of the removal of the sthenic diathesis, restore the absorbent vessels to their healthy condition, who shall say that, merely in consequence of this restored natural absorption, the entire subsidence of an ascites, which is seen to succeed in one night to abundant intestinal evacuation, consequent on the administration of some drastic medicine, takes place? Besides, if by the simple removal of the sthenic diathesis of the body and of the lymphatics, these remedies cure dropsy, why has no cure ever been obtained, or, as we maintain, ever will be obtained, with the true contra-stimulant remedies, such as the lauro-cerasus, the belladonna, &c.?

But before terminating this discussion, we cannot do otherwise than make some observations on the opinions on which Signor Rasori prides himself, at page 176 of the third edition of his excellent work on the Petechial Fever of Genoa. He says, "that his treatment of sthenic dropsies, (when he was professor of pathology, and physician to the Hospital of Pavia), was not conducted with pretended specifics—the language of quackery or ignorance, and the cause of grievous errors in practice—but with those very remedies, freely employed, which are adapted to any other sthenic disease; purgatives of every kind, whether mild or drastic, tartar emetic, nitre, abundant

drink, and low diet." Then the cure was not with specifics, but always with evacuants. Behold the real specifics for dropsy! If he wished to prove that, in the cure of these dropsical patients the only question was to overcome the sthenic diathesis—by which, according to him, the disease is kept up, and that the effect of these evacuants could depend solely on their anti-sthenic or contra-stimulant action—he ought to be able to shew cures of dropsical patients with the true contra-stimulants alone, such as the lauro-cerasus, belladonna, hyoscyamus, &c: not being able certainly to assert that they have employed the former remedies in preference to the latter; because their contra-stimulant action is directed specially to the lymphatic system, which would be not only a gratuitous and hypothetical assertion, but contradicted, moreover, by their effects, always the same, as we have observed in every state of health and of disease. And here it may be permitted us to deny absolutely the other merely systematic proposition, that we sometimes see opiates, æther, and bark, operate as diuretics;—a proposition put forth gratuitously in this place, in order to deny the diuretic property of those substances which the observation of all times has sanctioned, and of which any one may satisfy themselves by taking them in a state of health.

It is, therefore, for all these reasons, that we maintain the humoral evacuation, produced by emetico-cathartic remedies, to arise from the physical action exercised by these substances irritating the structures of the intestine destined for secretion; and that these, in consequence of the organic laws of irritation, laid down in the first part of this work, having

their action increased, caused the increased evacuation or secretion to follow.

Nor certainly do the cures of dysentery by Dr. Pisani, effected by jalap alone, or combined with neutral salts, or those of his master, Signor Rasori, by gamboge, present any insuperable difficulty to this view. In the same proportion that the dejections were diminished in number, but increased as to quantity, the malady was cured, for the matter was thrown out which had occasioned the dysentery in the interior of the intestines.

Now what we have advanced in reference to drastics may be extended to diuretic and diaphoretic medicines, while from these we select the digitalis, which we are much inclined with Professor Fanzago to distinguish as possessing two modes of action—one of irritation, and the other of contra-stimulus; but in this sense, that this plant, like all other poisonous plants, possesses, besides, the principles which exercise an irritating property, producing pain when in contact with various animal structures; one more hostile to life — *contra-stimulus*. Hence the first is that which, being unable to be assimilated, passes with the blood into the organs secreting the urine, and augments their secreting functions, from whence arises (in a sense entirely organic) a painful and irritating effect, whilst the contra-stimulant principle which it possesses will influence greatly the cure every time the dropsy shall have been kept up by a real inflammatory condition; but when this shall have entirely vanished, or only

exists with its product, dropsy, an enfeebling of the whole system of organic actions: even while it promotes humoral evacuations, it will produce a bad, a most evil effect, with its contra-stimulant property rendering the vital actions still more weak and languid. Hence the mixture of spirit with the digitalis, used by the English, is most reasonable: and, in truth, the good effect of this mixture in cases of dropsy, as employed by them, and its diuretic properties continuing unaltered, ought to be more than sufficient to prove that the power of digitalis in promoting the evacuation of urine arises from a very different cause than its contra-stimulant action.

And in reference to these principles, which cannot be assimilated by the circulating system, we do not, in truth, see sufficient reason to marvel so greatly as Dr. Morechini does, in order to determine us to believe that every kind of urine is not always separated from the blood, but that it may succeed to a direct transference of different substances from the chylopoietic to the uripoietic viscera, independent of the sanguiferous system. Nor can the results of the experiments of Darwin or Rasori move us, which would appear to demonstrate, that no traces were found in the blood of some substances introduced into the stomach, while they were manifested in the urine.

Might not these elements be separated in the blood, and recombined with others which no longer present to our senses the usual signs of their presence, and even elude chemical reactives, but become recomposed in the secreting apparatus of the different animal

fluids. It may be added also, that we are inclined to believe with MM. Henry and Pearson, that if these substances are really discoverable in the blood, they should be sought for in the arteries, and not in the veins.

But if in these substances with which dropsy is cured we must not maintain any virtue to exist except the sensible quality of promoting this or that humoral secretion or evacuation, how will the pathologists explain, under their employment, the disappearance of the fluid morbidly collected in the different cavities which constitutes dropsy? and, in truth, for any one, not so foolishly ready to attribute hypothetical properties to these or those substances, nor to describe certain conditions of organs never demonstrated to exist by physiological or pathological anatomy, the cure of dropsy, by the use of remedies which the observation of all time has proved to be most efficacious, was certainly still problematical. Thus no one hitherto has answered the difficulties proposed by Rasori, against the cure of dropsy by substances possessing the power of increasing the secretion of urine. He thus expresses himself:— "Whatever may be the kind of dropsy, the fluid which constitutes it is extravasated in a cavity, that is to say, out of the circulation, while, on the contrary, the supposed diuretic action is exercised on the kidneys, which is to say, within the course of the circulation. This being the case, the diuretic might produce a diabetes, by the increased quantity of urine which the kidneys might separate from the blood in less time than ordinarily; but this action has

nothing ro do with the extravasated lymph, which is beyond the action of the kidneys, and removed from the mass of the blood." Which first reflection might be understood as being just when extended to the action of emeto-cathartic remedies.

But the cure of dropsy is still a secret to the most moderate and reasonable among the contra-stimulists, who maintain that these substances are indirect contra-stimulants, while, besides it not being easy, as we have already seen, to comprehend how with the single removal by their action (which is a debilitating one), of the imaginary sthenic state of the absorbents, certain sudden cures of dropsy ensue. It is, moreover, absolutely impossible to explain how the same substances are necessary to the cure even of those dropsies in which the general circle of action is decidedly enfeebled and languid, and which they call asthenic, and in which it becomes necessary to administer them at the same time with stimulant remedies.

And from this fact it would have been equally impossible for us to understand the cure of dropsy, if we had not proved that organic law of the lymphatic system which respects increased activity of the absorbent system, when there is a deficiency of fluid occasioned by the great loss of the animal humours. In the meantime, having demonstrated by facts that dropsy is merely a product of inflammation, we may well comprehend how it could be overcome, and its source removed, by these evacuating, and hence debilitating, substances, but never how the disappear-

ance of the fluid would succeed, and still less how they must be necessary for the cure of dropsy, not only when inflammation no longer exists, but there is a decided enfeeblement of vital action, and in which the practice of all physicians has shewn it to be necessary to administer stimulants. But it was by the proposed law of organic life, that through the humoral discharges, promoted by these evacuating substances, inducing necessarily in the circulating system a relative defect of fluid, the lymphatics must take on a state of thirst, or an increased activity in their absorbing power, that we have understood easily all the facts relating to the cure of dropsy, and have been able to establish, on this important pathological question, a theory which partakes in no way of the nature of an hypothesis.

CHAPTER XI.

The indications of the cure of Dropsy, derived from the opinions lately explained.

The curative indications of dropsy cannot be reduced to fewer than these two general ones :—

1. To destroy the source of the morbid collection of fluid.

2. To evacuate the existing collection of fluid.

And these, in truth, were always reputed as indications, by all physicians ; but inasmuch as no one, up to this time, has displayed or established irrefragably the true source of dropsy, through all the facts appertaining to the disease, hence in the discrepancy which existed in the theories invented in reference to it, in the different schools, the curative method answering to this first indication must necessarily have been erroneous and uncertain. And even in reference to that method of the physicians, most attached to, and most uniform in following their preconceived

ideas, a method which appeared to the greater number, supported by facts, viz. the stimulating one—that is, precisely the one opposed to what is called for to subdue the pathological process which constitutes the source of dropsy—it is not to be wondered at that, in following such a course, they should have been little fortunate in the cure of the disease; more especially the physicians at the conclusion of the eighteenth century, who were not permitted by the laws of excitability to adopt at the same time evacuants, except when, by good fortune for their patients, they deceived themselves in their judgment of the vital action of the latter medicines.

But we have with sufficient reason established—besides having demonstrated that dropsy is a morbid collection of fluid of new formation, or consisting of a morbid secretion formed by the surfaces of the parts where it is found—that the pathological condition taken on by these surfaces, which enables them to produce the disease, is no other than inflammation. This, we say, we have proved from the four following facts:—

1. That the dropsical fluid differs from that which naturally exhales from the cavities of the body.

2. That it is exactly similar to what is visibly produced by inflammation.

3. That it is found only with organic alterations, undoubtedly the product of inflammation.

4. That all physicians have seen dropsy succeed to diseases maintained by them to be decidedly inflammatory.

Now, investigating the facts contained in the works of the greatest observers, taken from the daily practice of all physicians, relative to the method of cure in dropsies—in the examination of which we have seen that every cure of this disease has always been obtained by one or other of these two methods, viz. either by the employment of substances capable of increasing one or other of the humoral discharges, either alone or in combination with others which enfeeble organic movements; or by administering with these evacuants substances capable of exciting actions and functions which maintain the necessary nutrition of parts, (with which facts we have demonstrated the theory of diathesis, in the production, and the curative induction drawn from it, to be inconsistent)—we may plainly maintain that every case of dropsy which presents itself in practice will certainly be one of the following three:—

1. Either the dropsy accompanies, and hence is kept up by inflammation of the parts in which it is found;—

2. Or the inflammatory process may have already disappeared, either naturally or by the use of medicine, and the general circle of vital actions may be in a state nearly natural; but because the absorbing power of the lymphatics may have suffered by the

long compression made by the fluid, and because the natural action of the absorbents is not sufficient for its removal, it is necessary to increase and render more active this absorbing power;—

3. Or not only may the inflammatory state have ceased, but, besides, the organic actions of the animal machine may have become enfeebled and languid, either because the presence of the fluid morbidly collected may disturb the proper performance of chylification, sanguification, and consequent nutrition, or perhaps, unhappily, organic alterations exist in one or other of the viscera, from the preceding inflammation, which prevent the regular exercise of their functions, on which the well-being of the animal depends.

Every one will see, that in all cases of dropsy the original cause of the morbid collection is not always subsisting, but cases may be seen in which it is already overcome. It will be, therefore, of the first importance to the happy conclusion of the treatment, to discover first, in every case of dropsy which presents itself, whether the cause which we have marked out exists or not; and in case it does not, if the general system be in a tolerably healthy state, or languid and enfeebled: hence one of the curative indications, that of getting rid of the morbid collection of fluid, is, as we have seen, common to all cases of dropsy.

Considering, then, the first indication, we may fear-

lessly maintain, that it can alone occupy us in the cases in which the inflammation still exists, which keeps up and increases the morbid collection of fluid: but besides attending to the first, it is also necessary at the same time to fulfil the second indication. Now the means which carry this into effect, are, as all know, the evacuation of blood, and the administration of those substances which enfeeble directly the impulses of organic action, and inflammation, which is the increase of these, contra-stimulants, properly so called, and also of other medicines which produce the same effect, by promoting the evacuation of the animal fluid.

In reference to these last substances it will be well to remember also, that whilst they appear to be the most proper to subdue dropsy, and hence were always most commonly used, inasmuch as they fulfilled both indications, viz. the destruction of the source of the morbid collection of fluid, and also the expulsion of it, through the medium of the evacuation caused by their action, and the consequent increase in the activity of the absorbents, in consequence of the impoverished condition of the fluid in the circulating system.

And on this subject it will be necessary to observe, that these substances are of themselves sufficient to effect alone the cure of dropsy, not only in the cases in which the inflammatory process actually existing, and which keeps up the complaint, is very slight, but also to destroy or remove the feebleness of organic action consequent on the evacuation of fluid.

Every time, on the contrary, that the inflammation no longer exists, the necessity for using the means necessary to overcome it must cease, and we must avoid both bleedings and contra-stimulant remedies; but the indication being the same, to disperse the fluid already collected, we must look to those remedies which experience has demonstrated to be the most powerful for this purpose.

Now these we shall see to be all those substances which promote the evacuation of the serous fluid: but the evacuation of these animal fluids is shewn by experience (we beg pardon of those who consider them to be contra-stimulants) to induce an enfeebled state of the organic functions. Being obliged necessarily to run the risk, by removing, even with these remedies, the morbid collection of fluid, of suffering the patient to perish through inanition or real weakness, it will be our aim to administer also substances demonstrated by experience to be capable of increasing vital power, and of maintaining the necessary nutrition of parts.

It being conceded that the inflammation no longer exists which produced the dropsy, but there is really only present the languid condition of the vital forces, any one may see, in this case, how much the necessity is increased of administering the substances before mentioned, at the same time with those which stimulate the absorbents, that is, evacuants—which, as we have seen, are always necessary to the cure of dropsy.

And here it may be observed, that with our doctrine we may finally cut the knot of the controversy among physicians, as to the advantage or non-advantage of the paracentesis in ascites.

For if the morbid collection of fluid be enormous and of long standing, will it not be obvious to think that the absorbents would suffer, as has already been mentioned, by the pressure of fluid against membranous surfaces? and hence will it not be a good practice, taking away the pressure by the immediate evacuation of the water, to induce the desired active state of the lymphatics by remedies? But that which on this subject it will be equally important to determine in practice, is, whether an inflammatory condition of the membranous surfaces be actually existing or not.

Now the presence of this condition, even in ascites of long standing, is in truth much more frequent than has been commonly believed by physicians; and we incline to attribute principally to this state the rare occurrence of the radical cure of ascites by paracentesis, (to a degree, that some even reject its employment as useless), because after the operation blood-letting is no longer thought of. We shall not, however, be far from the truth, if we lay it down as a rule that tapping is not, in general, desirable in an actually inflamed condition of the membranous surfaces; and if it is wished to adopt it, we ought not afterwards to desist from blood-letting, (in proportion to the severity of the inflammation which continues),

at the same time using evacuating remedies and real contra-stimulant medicines. When, however, we discover, that without doubt the inflammatory process which produced the ascites is overcome, then the operation of tapping will be more than desirable, and still more so in the case in which the general system is in a sensible state of feebleness.

But to our theory of the cure of dropsy, not less than to its cause, which appears to us to embrace all sorts of cases appertaining to this disease, we are persuaded that some one will think it right to oppose a grave objection in the radical cure of hydrocele obtained by incision, and the injection of some stimulant fluid. How, in fact, will he say, can we recognize the origin of the fluid of a hydrocele from an inflammatory state, if the means employed, with the happiest success, are, in fact, to produce an inflammation in the same structure? In fact, every one has, in the opinions already delivered, sufficient materials to overcome such imposing difficulties with facility.

In Chapters II., III., and IV., we have shewn that it is a given degree of inflammation, and no other, which generates the fluid in which dropsy exists. Hence, where is the wonder, that by changing by art the inflammatory condition of the tunica vaginalis, which produces dropsy, into that which pours out coagulable lymph, the means are taken away from the membrane of pouring out water, and even the cavity obliterated which contained the fluid?

Hence, therefore, all other dropsies, whatever be the part in which they are found, must recognize the universal cause (inflammation), hitherto irrefragably demonstrated as their origin.

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